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## U. S. DEPARTMENT OF AGRICULTURE.

## DIVISION OF AGROSTOLOGY.

[Grass and Forage Plant Investigations.]

## STUDIES

ON

## AMERICAN GRASSES.

## I. SOME RECENT COLLECTIONS OF MEXICAN GRASSES.

By F. LAMSON-SCRIBNER and ELMER D. MERRILL.

II. NOTES ON PANICUM NITIDUM LAM., PANICUM SCOPARIUM LAM.,  
AND PANICUM PUBESCENS LAM.

By F. LAMSON-SCRIBNER and ELMER D. MERRILL.

## III. MISCELLANEOUS NOTES AND DESCRIPTIONS OF NEW SPECIES.

By F. LAMSON-SCRIBNER and CARLETON R. BALL.

ISSUED JANUARY 9, 1901.



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1900.

## LETTER OF TRANSMITTAL.

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UNITED STATES DEPARTMENT OF AGRICULTURE,  
DIVISION OF AGROSTOLOGY,  
*Washington, D. C., October 3, 1900.*

SIR: I have the honor to transmit herewith the manuscript of three papers embodying studies in systematic agrostology made in this Division, and I respectfully recommend their publication under the general title of "Studies on American Grasses," in conformity with papers of like character previously published by this Division.

Respectfully,

F. LAMSON-SCRIBNER,  
*Agrostologist.*

HON. JAMES WILSON,  
*Secretary of Agriculture.*

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## I.—SOME RECENT COLLECTIONS OF MEXICAN GRASSES.

By F. LAMSON-SCRIBNER AND ELMER D. MERRILL.

### INTRODUCTION.

In this paper are enumerated 227 species and varieties of Mexican grasses, of which 11 species and 1 variety are described as new. The specimens on which the list is based include the following recent collections from Mexico.

Forty-four specimens collected by Mr. C. L. Smith in 1894, chiefly in the State of Vera Cruz; 100 specimens collected in 1897 by Dr. J. N. Rose in the Sierra Madre Mountains and along the Pacific coast; 122 specimens collected by Dr. E. Palmer in 1896, chiefly on the western coast; 50 specimens collected by Dr. E. Palmer in 1897, chiefly from the State of Durango; 98 specimens collected by Dr. E. Palmer in 1898, chiefly from the State of Coahuila; a collection by Mr. C. G. Pringle in 1896 from the State of Colima, and another in 1899 by the same collector from the State of Vera Cruz; and 40 specimens collected by Mr. E. W. Nelson in 1899 from the State of Chihuahua. In addition to these collections are also included the few species secured by Messrs. Rose and Hough in 1899, a few by Mr. Pringle previous to 1896, and several by Mr. J. G. Smith in 1892.

Since the publishing of Fournier's Mexican Plants in 1881, considerable work has been done on the grass flora of Mexico, but the publications on the subject are widely scattered throughout the periodical literature. The only recent articles dealing entirely with Mexican grasses are "A List of the Grasses Collected by E. Palmer in the Vicinity of Acapulco, Mexico, 1894-95," by F. Lamson-Scribner;<sup>1</sup> "Some Mexican Grasses Collected by E. W. Nelson in Mexico, 1894-95," by F. Lamson-Scribner and Jared G. Smith;<sup>1</sup> and Circular No. 19 of the Division of Agrostology on "New or Little Known Mexican Grasses," which was issued January 2, 1900. In order to make the present paper more complete, the grasses enumerated in Circular No. 19 have been included, each species that was considered in that circular being marked with an asterisk.

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<sup>1</sup> Bul. 4, Division of Agrostology, U. S. Department of Agriculture.

## LIST OF SPECIES.

**Euchlæna mexicana** Schrad. Ind. Sem. Hort. Goett. (1832); Linnaea, 8: 25 (1833).  
Sierra Madre Mountains, altitude 1,600 m., State of Durango, 3513 J. N. Rose,  
August 15, 1897; State of Durango, 743 E. Palmer, September, 1896.

A plant very much resembling corn, found along water ditches at Navociana Ranch,  
very valuable for forage, passing under the common name of "Maizillo."

**Tripsacum fasciculatum** Trin. in Steud. Nom. ed. 2, 2: 712 (1841).

Durango, State of Durango, 537 E. Palmer, August, 1896; on the road near Hueju-  
quila, State of Jalisco, 3570 J. N. Rose, August 25, 1897.

**TRIPSACUM PILOSUM** Scribn. & Merrill, sp. nov. (Fig. 1.)

A stout, erect perennial about 15  
dm. high, with broad, lance-  
olate, pubescent leaves.  
Culms about 1 cm. in dia-  
meter at the base, smooth  
below, pilose with rather  
short white hairs below the  
panicle; nodes smooth;  
sheaths longer than the  
internodes, subcompressed  
above, scabrous, the lower  
ones strongly tuberculate-  
hispid; ligule very short,  
truncate; leaf blades 4 to  
6 dm. long, 2 to 3 cm. wide,  
acute, gradually tapering to the narrow base,  
strongly strigose - pubes-  
cent on both sides or some-  
times somewhat pilose be-  
neath, very strongly ser-  
rulate-scabrous on the mar-  
gins. Inflorescence terminal  
and axillary, fascicu-  
late; branches of the termi-  
nal inflorescence about 2  
dm. long, erect; the lower  
pistillate spikelets few, the  
upper staminate ones num-  
erous, about 8 mm. long,  
green or purple, the outer  
glumes faintly 7 to 11  
nerved, acute or somewhat  
obtuse, scabrous on the  
keel and margins near the  
apex.



FIG. 1.—*Tripsacum pilosum* Scribn. & Merrill: a A staminate  
spikelet.

recognized by its broad and rather soft pubescent leaves and hispid sheaths.  
Collected on the road between Colotlan and Bolanos, State of Jalisco, 2841 J. N. Rose,  
September 7, 1897.

\***Ischænum latifolium** Kunth, Rev. Gram. 1: 168 (1835).

Under the spray of the Cascade in the Barranca of Texola, near Jalapa, altitude  
1,100 m., 8106 C. G. Pringle, April 30, 1899.

**Trachypogon montufari** Nees, Agrost. Bras. 342 (1829).

Las Sedas, altitude 2,000 m., State of Oaxaca, 953 C. L. Smith, September 8, 1894; Durango, State of Durango, 383 E. Palmer, July, 1896.

**Elionurus barbiculmis** Hack. in DC. Monog. Phan. 6: 339 (1889).

Durango, State of Durango, 549 E. Palmer, August, 1896; near San Juan Capistrano, State of Zacatecas, 2407 J. N. Rose, August 18, 1897.

**Elionurus tripsacoides** H. B. K. in Willd. Sp. Pl. 4: 941 (err. typ. 741) (1805).

Jalapa, State of Vera Cruz, 1623½ C. L. Smith, 1894.

**Andropogon contortus** L. Sp. Pl. 1045 (1753). (*Heteropogon contortus* R. & S. Syst. 2: 836 (1817).)

Durango, State of Durango, 540 E. Palmer, August, 1896; Bolanos, State of Jalisco, 2938 J. N. Rose, September 10-19, 1897.

**Andropogon liebmanni rariplis** Hack. in DC. Monog. Phan. 6: 413 (1889).

In the Sierra Madre Mountains, near Santa Teresa, Territorio de Tepic, 2222 J. N. Rose, August 12, 1897.

**Andropogon macrourus** Michx. Fl. Bor. Am. 1: 56 (1803).

San Antonio Valley, State of Oaxaca, 970 C. L. Smith, September 1, 1894; Durango, State of Durango, 251 E. Palmer, June, 1896.

**Andropogon melanocarpus** Ell. Sk. Bot. S. C. and Ga. 1: 146 (1817) (*Heteropogon melanocarpus* Benth. Journ. Linn. Soc. 19: 71 (1881).)

In the Sierra Madre Mountains, west of Bolanos, State of Jalisco, 2596 J. N. Rose, September 15-17, 1897.

**Andropogon nutans incompletus** Hack. in DC. Monog. Phan. 6: 531 (1889).

Las Sedas, State of Oaxaca, 917 C. L. Smith, September, 1894.

**ANDROPOGON PRINGLEI** Scribn. & Merrill, sp. nov.

An erect caespitose perennial 9 to 11 dm. high, with slender culms, short leaves, and slender racemes 3 to 6 cm. long, terminal on the culm or its branches. Culms cylindrical, purplish, very smooth; nodes glabrous; sheaths much shorter than the internodes, glabrous, striate, rather loose, the lowermost compressed, the upper ones somewhat inflated; ligule very short, truncate, ciliate-fringed with short hairs; leaf-blades pale green, those of the innovations linear, 8 to 11 cm. long, 1 to 2 mm. wide, pilose, with long white hairs on the upper surface near the base, smooth beneath, those of the culm rather rigid, linear-lanceolate, acute, 2 to 6 cm. long, 3 to 4 mm. wide, plane or folded, minutely strigose-pubescent at the throat, strongly serrulate-scabrous on the keel and margins near the apex, otherwise smooth. Racemes 3 to 4, subdigitate, rarely solitary, somewhat inclosed by the upper sheath or finally exserted; common rachis 1 to 2 cm. long; axis of the racemes 7 to 11 jointed, subflexuous, pilose with long white hairs, smooth and flattened on one side. Sessile spikelets linear-lanceolate, acute or acuminate, 6 to 8 mm. long, about twice exceeding the joints of the rachis; first glume lanceolate, acute, 2-toothed at the apex, scabrous on the keels above, otherwise glabrous, plane or slightly sulcate; second glume equaling the first, 1-nerved, acute, glabrous except at the scabrous apex; third glume about as long as the second, hyaline, smooth; flowering glume about 4 mm. long, hyaline, smooth, faintly 3-nerved, deeply cleft at the apex, bearing a slender geniculate awn 10 to 14 mm. long, which is twisted below the geniculation, scabrous above. Stamens one, about 1 mm. long. Callus-hairs about 1 mm. long. Pedicellate spikelets much smaller than the sessile ones, reduced to one or two purplish glumes, very narrowly linear-lanceolate, about 5 mm. long, scabrous at the apex; pedicels slender, slightly enlarged above, about three-fourths as long as the sessile spikelet, rather densely silky-bearded with erect or spreading white hairs about 4 mm. long.

Type specimen 6577 C. G. Pringle, Valley of Mexico, Federal District, October 23, 1896.

This species belongs to the subgenus *Arthrolophis* and is related to the group containing *Andropogon liebmanni* Hack., but differs from this and other related species in its swollen upper sheaths, much larger sessile spikelets, stouter and longer less pubescent racemes, which at first sight bear some resemblance to those of *A. provincialis* Lam.

**Andropogon saccharoides** Swartz, Prodr. Veg. Ind. Occ. 26 (1788).

Saltillo, State of Coahuila, 4 E. Palmer, April, 1898; 810 E. Palmer, September, 1898; near Casas Grandes, State of Chihuahua, 6342 E. W. Nelson, August 30, 1899.

**Andropogon saccharoides barbinodis** (Lag.) Hack. in DC. Monog. Phan. 6: 494 (1889). (*Andropogon barbinodes* Lag. Gen. et Sp. 3 (1816).)

Near Plateado, State of Zacatecas, 2758 J. N. Rose, September 3, 1897.

**Andropogon saccharoides leucopogon** (Nees) Hack. in DC. Monog. Phan. 6: 496 (1889). (*Andropogon leucopogon* Nees, Linnæa, 19: 694 (1845).)

Durango, State of Durango, 538 E. Palmer, August, 1896.

**Andropogon saccharoides perforatus** (Trin.) Hack. in DC. Monog. Phan. 6: 496 (1889). (*Andropogon perforatus* Trin. in Fourn. Mex. Pl. 2: 59 (1881).)

Santiago Papasquiaro, State of Durango, 469 E. Palmer, August, 1896.

**Andropogon saccharoides torreyanus** (Steud.) Hack. in DC. Monog. Phan. 6: 495 (1889). (*Andropogon torreyanus* Steud. Nom. ed. 2, 1: 98 (1840).)

Jalapa, State of Vera Cruz, 1623 C. L. Smith, 1894; Durango, State of Durango, 250 E. Palmer, June, 1896.

**Andropogon tener** Kunth, Rev. Gram. 2: 565 (1835).

Sienga, State of Durango, 858 E. Palmer, November, 1896.

**Anthepehora elegans** Schreb. Beschr. Gras. 2: 105, t. 44 (1772-1779).

Colima, State of Colima, 146 E. Palmer, 1897.

**Hilaria cenchroides** H. B. K. Nov. Gen. et Sp. Pl. 1: 117 (1815).

Durango, State of Durango, 379, 540 E. Palmer, July, 1896; Huejuquilla, State of Jalisco, 2542 J. N. Rose, August 25, 1897, growing on the banks of water ditches in alkali bottoms.

**Hilaria mutica** Benth. Journ. Linn. Soc. 19: 62 (1881).

Torreón, State of Coahuila, 506 E. Palmer, October, 1898.

**Ægopogon geminiflorus** H. B. K. Nov. Gen. et Sp. Pl. 4: 133, t. 43 (1820).

Sierra de San Felipe, State of Oaxaca, 914, 1816 C. L. Smith, 1894; near Plateado, State of Zacatecas, 2791 J. N. Rose, September 4, 1897; Sierre Madre Mountains, 10 miles north of Pachico, State of Chihuahua, 6294 E. W. Nelson, August 25, 1899.

**Nazia aliena** (Spreng.) Scribn. U. S. Dept. Agr. Div. Agros. Bul. 17: 28, fig. 324 (1899). (*Lappago aliena* Spreng. Neue Entd. 3: 15 (1822).)

Durango, State of Durango, 763 E. Palmer, October, 1896; Saltillo, State of Coahuila, 396 E. Palmer, September, 1898, in cemeteries and waste places.

**Arundinella auletica** Rupr. Bul. Acad. Brux. 9: 242 (1842).

Jalapa, State of Vera Cruz, 1892 C. L. Smith, 1894.

\* **Paspalum candidum** Kunth, Mém. Mus. Par. 2: 68 (1803). (See Kew Index.)

Barranca de Texola, near Jalapa, State of Vera Cruz, altitude 1,100 m., 7884 C. G. Pringle, April 30, 1899.

**Paspalum conjugatum** Berg. Act. Helv. 7: 129, t. 8 (1772).

Colima, 16 E. Palmer, July, 1897, in low, wet bottom lands.

**Paspalum distichum** L. Amoen. Acad. 5: 391 (1760).

Durango, State of Durango, 192 E. Palmer, June, 1896; Saltillo, State of Coahuila, 259, 391 E. Palmer, 1898. This grass, commonly called "sacate de grama," is found about ponds and water courses, cows and horses being very fond of it. It is used medicinally as a blood purifier, a hot tea being made which is taken internally.

**Paspalum inops** Vasey, Contr. U. S. Nat. Herb. 1: 281 (1893).

Near Plateado, State of Zacatecas, 2781 J. N. Rose, September 3, 1897.

**PASPALUM NOTATUM** Flügge, Monog. 106 (1810).

Las Sedas, altitude 2,000 m., State of Oaxaca, 933 C. L. Smith, September 8, 1894; Colima, 138 E. Palmer, August, 1897.

**PASPALUM PANICULATUM** L. Syst. Nat. ed. 10, 855 (1758-59).

Coatzacoalcos, Isthmus of Tehuantepec, State of Vera Cruz, 1053 C. L. Smith, March 16, 1895; Rosario, State of Sinaloa, 1545 J. N. Rose, July 7, 1897; Colima, 18 E. Palmer, July, 1897.

**Paspalum plicatulum** Michx. Fl. Bor. Am. 1: 45 (1803).

Coatzacoalcos, Isthmus of Tehuantepec, State of Vera Cruz, 1054 C. L. Smith, March 12, 1895; between Rosario and Acaponeta, State of Sinaloa, 1885 J. N. Rose, July 28, 1897; foothills of the Sierra Madre Mountains, near Pedro Paulo, Territorio de Tepic, 1961 J. N. Rose, August 3, 1897; near Acaponeta, Territorio de Tepic, 3294 J. N. Rose, July 30, 1897; Colima, 144 E. Palmer, August, 1897.

**PASPALUM PROSTRATUM** Scribn. & Merrill, sp. nov. (*Pseudoceresia*).

A low, diffuse, spreading perennial with slender culms, broad rachis, and ovate-lanceolate leaves. Culms, 2 to 3 dm. long, prostrate, finally erect, glabrous, rooting at the lower nodes; nodes glabrous; sheaths loose, compressed, striate, smooth below, sparingly pilose above and on the margins, the lower ones shorter than or about equaling the internodes, the upper one elongated; ligule nearly obsolete; leaf-blades 1.5 to 3.5 cm. long, 5 to 10 mm. wide, rounded or truncate at the base, acute at the apex, pilose beneath and more sparingly so above, serrulate-scabrous on the cartilaginous margins, mid-nerve somewhat prominent on the lower surface for one-third the length of the leaf, vanishing. Primary axis 6 to 10 cm. long, glabrous; racemes 5 to 10, solitary, remote, alternate, spreading, bearded at the axils, the lower ones 2.5 cm. long, the upper ones shorter; partial rachis 2 to 3 mm. wide, thin, undulate-striate on the back, abruptly acute, smooth or serrulate-scabrous on the margins. Spikelets alternate, imbricate in two rows, short-pedicellate, elliptical-ovate, obtuse, smooth, 2 mm. long; first glume equaling the flowering glume, obtuse, thin, hyaline, 3-nerved, the midnerve faint, the marginal ones more prominent; second glume equaling the flowering glume, more firm in texture, 3 or faintly 5 nerved, slightly sulate; flowering glume elliptical, obtuse, very smooth. Palea equaling the glume, smooth, plane.

Type specimen 3343 C. G. Pringle, low lands near Patzcuaro, State of Michoacan, November 9, 1890.

This species belongs in the section *Pseudoceresia* and is distinguished from *Paspalum gracile* Rudge by its habit of growth, shorter leaves, solitary racemes, and larger spikelets. Distributed as *Paspalum gracile* Rudge.

**PASPALUM PROSTRATUM PYGMÆUM** Scribn. & Merrill, var. nov.

A low, densely cæspitose form 3 to 5 cm. high, with loose, pilose sheaths, densely pilose leaves 1 to 2.5 cm. long, 1 to 3 mm. wide, and short inflorescence of 1 to 3 spikes, which are 1 cm. long or less. Rachis and spikelets as in the species.

Type specimen 7167 C. G. Pringle, Pedrigal, altitude 2,600 m. (8,500 feet), Valley of Mexico, Federal District, September 30, 1896. In dry places by the railroad track.

**Paspalum pubiflorum** Rupr. Bul. Acad. Brux. 9: 237 (1842).

Durango, State of Durango, 871 E. Palmer, November, 1896; Torreon, State of Coahuila, 515 E. Palmer, October, 1898; near Colotlan, State of Jalisco, 3602 (in part) J. N. Rose, August 28, 1897.

**PASPALUM ROSEI** Scribn. & Merrill, sp. nov. (Fig. 2.)

A densely cæspitose, simple, erect, glabrous perennial, about 6 dm. high with elongated leaves and long-exserted inflorescence of 2 or 3 slender, divergent spikes. Culms slender, smooth; nodes pilose; sheaths striate, scabrous, short; ligule very short, ciliate-fringed; leaves linear, plane or folded, acute, those of the

culm 1 or 2, short; basal leaves numerous, 1 to 3 dm. long, glabrous beneath, more or less pilose with scattered hairs on the upper surface near the base. Inflorescence long-exserted, the branches slender, spreading, 5 to 7 cm. long, undulate, smooth, somewhat pubescent or pilose at the axils. Spikelets 4 mm. long, lanceolate, acute, alternate, very short pedicellate, appressed; first and second glumes equal, lanceolate, acuminate, 5-nerved, sparingly pilose with



FIG. 2.—*Paspalum rosei* Scribn. & Merrill: *a*, *b*, spikelets; *c*, same with the outer glumes removed.

scattered hairs, especially at the base; flowering glume oblong, obtuse, 3 mm. in length, glabrous, bearing a tuft of few short hairs at the apex. Palea linear-lanceolate, convex, equaling the glume.

Foothills of the Sierra Madre Mountains, between Pedro Paulo and San Blascito, 1995 J. N. Rose, August 4, 1897.

Related to *Paspalum neesii* Kunth, but differing in its much smaller spikelets and plane, smooth leaves.

***Paspalum squamulatum*** Fourn. Mex. Pl. 2: 11 (1881).

Jalapa, State of Vera Cruz, C. L. Smith, 1894.

***Paspalum tenellum*** Willd. Enum. Hort. Berol. 89 (1809). (*P. elegans* Flügge, Monog. 183 (1810).)

Lava beds, Pedrigal, Valley of Mexico, Federal District, 6474 C. G. Pringle, September 1, 1896.

**Paspalum velutinum** (DC.) Kunth, Rev. Gram. 1: 27 (1835). (*Milium velutinum* DC. Cat. Hort. Monsp. 126 (1813).)

Sandy fields, base of Sierra de Ajusco, altitude 1,900 m., Federal District, 6623 C. G. Pringle, October 29, 1896. This specimen is certainly identical with what Fournier<sup>1</sup> considered to be this species, and there can be little doubt but that it is the same as *Milium velutinum* DC. In habit very much resembling *Panicum sanguinale* L., and intermediate between the section *Digitaria* of the genus *Panicum* and the genus *Paspalum*.

**Eriochloa punctata** (L.) W. Hamilton, Prodr. Pl. Ind. Occ. 5 (1825). (*Milium punctatum* L. Amoen. Acad. 5: 392 (1759); *Eriochloa polystachya* H. B. K. Nov. Gen. et Sp. Pl. 1: 95 (1815).)

Durango, State of Durango, 524, 736 E. Palmer, August and September, 1896; Topolobampo, State of Sinaloa, 242 E. Palmer, September, 1897; Torreon, State of Coahuila, 509 E. Palmer, October, 1898, in rich, moist soil along the Nassus River.

**Isachne disperma** Doell, in Mart. Fl. Bras. 2<sup>2</sup>: 274 (1877).

Jalapa, State of Vera Cruz, 1804 C. L. Smith, 1894.

\***Panicum albomaculatum** Scribn.

U. S. Dept. Agr. Div. Agros. Cir. 19: 2 (January, 1900).

A rather slender, erect, sparingly branched perennial, 6 to 8 dm. high, with striate sheaths, short, ciliate ligules, and spreading panicles 12 to 16 cm. long. Nodes glabrous, the overlapping margins of the sheaths very densely ciliate or subvillos. Leaf-blades 7 to 12 cm. long, 5 to 10 mm. wide (when dry), very acute, rounded at the somewhat clasping base, scabrous on the nerves below, glabrous above, sharply serrulate-scabrous on the narrowly cartilaginous margins, which are ciliate near the base. Axis and branches of the panicle glabrous, the lower longer branches 8 to 10 cm. long. Spikelets ovate, obtuse, 2.5 mm. long; first glume obtuse, 1-nerved, subremote, clasping the pedicel; the second and third glumes 7-nerved, thinly pubescent with short hairs, about equaling the smooth and shining fourth glume; the third glume has a thin, short palea. The exposed

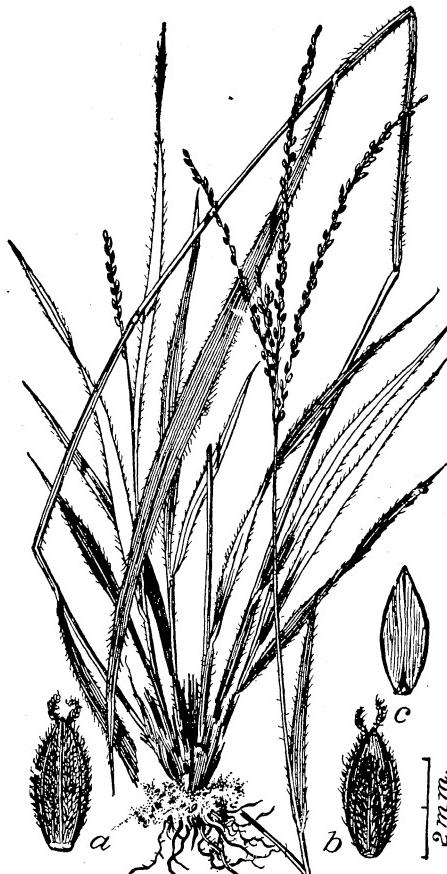


FIG. 3.—*Panicum badium* Scribn. & Merrill: a, b, spikelets enlarged; c, same with outer glumes removed.

<sup>1</sup> Mex. Pl. 2: 8 (1881).

portion of the culm and sheath purplish, the latter (in the type) white-spotted with small oblong spots or blotches.

Dry, rocky hills, Patzcuaro, State of Michoacan, 5203 C. G. Pringle, October 10, 1892. Allied to *Panicum scabriuscum* Ell., but readily distinguished by its larger spikelets, less densely flowered panicles, and distinctly cartilaginous, serrulate leaf margins. The plant throughout is more slender.

**Panicum avenaceum** H. B. K. Nov. Gen. et Sp. Pl. 1: 99 (1815).

Durango, State of Durango, 741 E. Palmer, August, 1896.

**PANICUM (SYNTHERISMA) BADIUM** Scribn. & Merrill, sp. nov. (Fig. 3.)

A slender, erect, caespitose perennial, 4 to 7 dm. high, with linear-lanceolate leaves and digitate panicles of 3 to 5 erect spike-like branches 4 to 7 cm. long. Culms geniculate and compressed below, glabrous or with few long white hairs above; nodes glabrous; sheaths loose, shorter than the internodes, striate, pilose, with rather long spreading hairs; ligule about 2 mm. long, acute or obtuse, hyaline except on the narrow brown margin; leaf-blades 5 to 20 cm. long, 5 to 6 mm. wide, plane, acute, slightly narrowed at the base, pilose on both sides with few, long, white hairs. Inflorescence exserted, the branches slender, glabrous. Spikelets in pairs, one short-pedicellate, one long-pedicellate, ovate, acute, 2.5 mm. long; first glume obsolete; second and third glumes densely pubescent with rather short brown hairs, the former about three-fourths as long as the flowering glume, acute, 3-nerved, the latter equaling the flowering glume, 3 to 5 nerved; flowering glume narrowly ovate, acute or short-acuminated, dark brown, obscurely striate or pitted.

Sierra de San Felipe, State of Oaxaca, altitude between 2,300 and 2,800 m., 915 C. L. Smith, October 6, 1894.

Distributed as *Anthennaria villosa* Beauv. which it somewhat resembles in the pubescence of the outer glumes, but very different in habit and inflorescence. Related to *Panicum phoxothrix* Trin. Icon. Gram. 1: t. 91 (1828) (*P. ferrugineum* Kunth, Rev. Gram. 1: 39; 2: 501, t. 163 (1835)), but readily distinguished by its much broader, pilose leaves, pilose sheaths and culms, and longer second glume.

**Panicum bulbosum** H. B. K. Nov. Gen. et Sp. Pl. 1: 99 (1815).

Santiago Papasquiaro, State of Durango, 467 E. Palmer, August, 1896; near Monte Escobedo, State of Jalisco, 2609 J. N. Rose, August 26, 1897; near Dolores, Territorio de Tepic, 2053 J. N. Rose, 1897; between Agnacata and Dolores, 3361 J. N. Rose, August 6, 1897; between Pedro Paulo and San Blascito, Territorio de Tepic, 1999 J. N. Rose, August 4, 1897.

**Panicum caespitosum** Swartz, Fl. Ind. Occ. 1: 146 (1797).

Durango, State of Durango, 433 E. Palmer, August, 1896.

**Panicum colonum** L. Syst. Nat. ed. 10, 870 (1758-59).

Rosario, State of Sinaloa, 1544 J. N. Rose, July 7, 1897; between Acaponeta and Pedro Paulo, Territorio de Tepic, 1923 J. N. Rose, August 2, 1897; Colima 169 E. Palmer, 1897; Torreon, State of Coahuila, 508 E. Palmer, October, 1898; Parras, 454 E. Palmer, October, 1898; near Colonia Garcia, State of Chihuahua, 6187 E. W. Nelson, August 1, 1899; near Pachico, State of Chihuahua, 6298, 6301 E. W. Nelson, August 26, 1899.

**Panicum compactum** Swartz, in Griseb. Fl. Brit. W. Ind. 552 (1864).

Near Huasemote, State of Durango, 3502 J. N. Rose, August 15, 1897.

**Panicum crus-galli** L. Sp. Pl. 56 (1753).

San Francisco, State of Vera Cruz, 1329 C. L. Smith, 1894; Durango, State of Durango, 252, 730 E. Palmer, June-September, 1896; Santiago Papasquiaro, State of Durango, 466 E. Palmer, August, 1896; near Colotlan, State of Jalisco, 3606 J. N. Rose, August 29, 1897; below Pachico, State of Chihuahua, 6244 E. W. Nelson, August 22-24, 1899; between Casas Grandes and Sabinal, State of Chihuahua, 6355a E. W. Nelson, September 4-5, 1899.

Common in low ground about water courses and even in shallow water, reaching to a height of 5 or 6 feet. It is a very prolific species, eagerly eaten by domestic animals. The seeds, which become dark at maturity, are much eaten by birds.

**Panicum crus-galli muticum** Vasey, Contr. U. S. Nat. Herb. **3**: 37 (1892).

Saltillo, State of Coahuila, 380 E. Palmer, September, 1898.

**Panicum fasciculatum** Swartz, Prodr. Veg. Ind. Occ. 22 (1788).

Rosario, State of Sinaloa, 1834 J. N. Rose, July 24, 1897.

**Panicum fimbriatum** (Link) Kunth, Rev. Gram. **1**: 33 (1835). (*Digitaria fimbriata*

Link, Hort. Berol. **1**: 226 (1827); *Syntherisma fimbriata* Nash, Bul. Torr. Bot. Club, **25**: 302 (1898).)

Colima, 9 E. Palmer, July, 1897, in a deep, shady ravine; Topolobampo, State of Sinaloa, 234 E. Palmer, September, 1897; Saltillo, State of Coahuila, 387 E. Palmer, September, 1898.

**Panicum fuscum** Swartz, Prodr. Veg. Ind. Occ. 23 (1788).

Topolobampo, State of Sinaloa, 250 E. Palmer, September, 1897, in an opening on a very stony mountain slope.

**Panicum hallii** Vasey, Bul. Torr. Bot. Club, **9**: 61 (1884).

Durango, State of Durango, 525 E. Palmer, August, 1896.

**Panicum hirticaulum** Presl, Rel. Haenke. **1**: 308 (1830).

Between Agnacata and Dolores, Territorio de Tepic, 3351 J. N. Rose, August 6, 1897; near Acaponeta, 1889, 3281 J. N. Rose, July 29, 1897; between Rosario and Acaponeta 1883, 1878 J. N. Rose, July 28, 1897 (the last four numbers are depauperate); Colima, 14, 143, 145 E. Palmer, July, 1897; Topolobampo, State of Sinaloa, 249, 251 E. Palmer, September, 1897; near Pachico, State of Chihuahua, 6297 E. W. Nelson, August 25, 1899; between Casas Grandes and Sabinal, State of Chihuahua, 6355 E. W. Nelson, September 4-5, 1899.

**Panicum holciforme** Steud. Nom. ed. 2, **2**: 257 (1841).

Durango, State of Durango, 253 bis E. Palmer, June, 1896.

\***Panicum inflatum** Scribn. & Smith, U. S. Dept. Agr. Div. Agros. Cir. **16**: 5 (1899).

Gravelly banks near Jalapa, State of Vera Cruz, altitude 1,250 m., date not given, 7883 C. G. Pringle, 1899.

**Panicum insulare** (L.) Mey. Prim. Fl. Esseq. 60 (1818).

Durango, State of Durango, 715 E. Palmer, September, 1896.

**Panicum lanatum** Rottb. Act. Lit. Univ. Hafn. **1**: 269 (1778). (*P. leucophaeum* H. B. K. Nov. Gen. et Sp. Pl. **1**: 97 (1815).)

Between Concepcion and Acaponeta, 1900 J. N. Rose, July 29, 1897.

\***Panicum laxiflorum** Lam. Encycl. **4**: 748 (1797). (*P. xalapense* Kth.?)

A low, densely caespitose perennial, 1.5 to 3 dm. high, with crowded, lanceolate, acute, pilose leaves and spreading, ovate panicles 4 to 5 cm. long. Culms much branched near the base, glabrous; nodes bearded with spreading hairs; sheaths pilose with soft, spreading, or reflexed hairs; ligule a dense fringe of hairs about 1 mm. long. Leaves 3 to 6 cm. long, 6 to 10 mm. wide, pilose on both surfaces with soft hairs, ciliate on the margins with long, spreading, papillate hairs. Axis of the panicle glabrous or pubescent. Spikelets oblong, obtuse, 2 mm. long; first glume broadly obtuse, about one-third the length of the spikelet, 3-nerved; the second and third glumes prominently 7-nerved, pubescent, with short, spreading hairs between the nerves.

Gravelly banks near Jalapa, State of Vera Cruz, altitude 1,250 m., 8083 C. G. Pringle, March 29, 1899; 1752 C. L. Smith, 1894.

Nearly identical with the grass from the Southern States which by recent authors has been referred to *P. laxiflorum* Lam.

**Panicum maximum** Jacq. Icones Pl. Rar. **1**: t. 13 (1781-1786).

San Francisco, State of Vera Cruz, 1409 C. L. Smith, 1894.

\***Panicum multirameum** Scribn. U. S. Dept. Agr. Div. Agros. Cir. 19: 2 (January, 1900).

A rather slender, tufted perennial, 20 to 30 cm. high, with glabrous culms, densely fasciculate-branched above, bearded nodes, and glabrous or thinly pilose sheaths which are bearded at the throat. Lower culm leaves 5 to 8 cm. long, those on the branches much shorter and narrower, sparingly ciliate near the base, pubescent beneath, minutely scabrous along the margins, which are very narrowly cartilaginous. Panicles loosely flowered, 2 to 4 cm. long. Spikelets about 2 mm. long, obtuse, and 7-nerved; the second and third glumes thinly pubescent; the fourth glume subacute; the broadly obtuse first glume one-third to nearly one-half as long as the spikelet.

Gravelly hills near Jalapa, State of Vera Cruz, altitude 1,250 m., 7882 C. G. Pringle, 1899; Orizaba, State of Vera Cruz, 593 J. G. Smith, February 17, 1892.

Allied to *Panicum ciliosum* Nash, but smaller, nodes more distinctly bearded, and leaves less ciliate.

**Panicum obtusum** H. B. K. Nov. Gen. et Sp. Pl. 1: 98 (1815).

Torreón, State of Coahuila, 504 E. Palmer, October, 1898; Saltillo, 394 E. Palmer, September, 1898; San Luis Potosí, 1631 E. Palmer, 1898; between Casas Grandes and Sabinal, State of Chihuahua, 6352 E. W. Nelson, September 4-5, 1899. Low places often overflowed. Extensively used as a purgative under the name of "purga de paridas."

\***Panicum pilosum macranthum** Scribn. U. S. Dept. Agr. Div. Agros. Cir. 19: 1 (January, 1900).

Secondary axes or branches of the panicle (longer lower ones) 3.5 cm. long, pilose with papillate hairs about 2 mm. long. Spikelets 2.2 mm. long, the outer glumes strongly scabrous on the keel near the apex, as are the fruiting glume and palea.

Swamps near Jalapa, State of Vera Cruz, altitude 1,230 m., 8195 C. G. Pringle, May 21, 1899.

**Panicum plantagineum** Link, Hort. Berol. 1: 206 (1833).

Near Colotlán, State of Jalisco, 3602 (in part) J. N. Rose, August 28, 1897.

\***Panicum polycaulon** Nash, Bul. Torr. Bot. Club, 24: 200 (1897).

Low places, borders of swamps, Minatitlán, State of Vera Cruz, 555 Jared G. Smith, June 30, 1892.

**Panicum repens** L. Sp. Pl. ed. 2, 87 (1762-63). (*P. littorale* Vasey, Bot. Gaz. 3: 106 (1878); *P. gouini* Fourn. Mex. Pl. 2: 28 (1881).)

Coatzacoalcos, Isthmus of Tehuantepec, State of Vera Cruz, 913 C. L. Smith, March 8, 1895.

**Panicum reticulatum** Torr. in Marcy's Explor. Red Riv. La. 299 (1852).

Between Rosario and Acaponeta, 1884 J. N. Rose, July 28, 1897.

**Panicum sanguinale** L. Sp. Pl. 57 (1753).

Colima, 148 E. Palmer, 1897, in a deep, shady ravine; Durango, State of Durango, 766 E. Palmer, October, 1896. Common in fence rows, etc.

**Panicum sanguinale ciliare** (Retz.) Vasey, U. S. Dept. Agr. Div. Bot. Bul. 8: 23 (1889). (*Panicum ciliare* Retz. Obs. 4: 16 (1779-1791).)

Rosario, State of Sinaloa, 1541 J. N. Rose, July 7, 1897.

**PANICUM (DIMORPHOSTACHYS) UNISPICATUM** Scribn. & Merrill, sp. nov.

A slender, erect perennial, 8 to 15 dm. high, with glabrous culms, sparingly pilose sheaths, lanceolate or linear-lanceolate leaves, and long-exserted solitary spikes .9 to 12 cm. long. Culms very smooth throughout; nodes smooth; sheaths equaling or shorter than the internodes, loose, striate, ciliate on the margins, smooth below, sparingly tuberculate-pilose above; ligule hyaline, membranaceous, lacerate, about 2 mm. long; the throat rather densely bearded, immediately

above the ligule, with rigid white hairs about 5 mm. long. Leaf-blades 15 to 30 cm. long, 6 to 12 mm. wide, plane, scarcely narrowed at the abruptly rounded and somewhat clasping base, gradually tapering to a very slender, attenuate and involute, filiform apex, very sparingly tuberculate-pilose on both sides or nearly smooth beneath, ciliate and scabrous on the cartilaginous margins. Inflorescence a pale green, long-exserted, erect or very slightly curved spike, solitary or 2 from the upper sheath, 9 to 12 cm. long, the spikelets in pairs, one sessile and one short-pedicellate, in two rows on one side of the smooth rachis. Spikelets ovate, acute, glabrous, 3 to 4 mm. long; first glume of the sessile spikelet one-third as long as the flowering glume, or shorter, obtuse, hyaline, not increasing in size toward the apex of the spike; that of the pedicellate spikelet lateral or twisted so as to appear in a lateral position, lanceolate, acuminate, about three-fourths as long as the flowering glume, 1-nerved, scabrous at the apex; second glume ovate, acute, glabrous, 3 or faintly 5 nerved, equaling the flowering glume in length; third glume concave, 3-nerved, slightly exceeding the flowering glume, subtending a lanceolate, hyaline, 2-nerved palea as long as the glume; flowering glume ovate, acute, minutely striate or pitted throughout. Palea similar in texture and markings, plane or slightly concave.

Type specimen 6717 C. G. Pringle, Valley of Oaxaca, State of Oaxaca, July 13, 1897. This species belongs to the group on which Fournier based his genus *Dimorphostachys*,<sup>1</sup> and is related to the South American *Panicum monostachyum*,<sup>2</sup> but is abundantly distinct, differing from the description and plate in Kunth's Rev. Gram. 380, t. 104, in its larger size, smooth nodes and culms, broader and not soft pilose leaves, larger spikelets, and much larger first glume of the sessile spikelet; moreover Kunth does not mention or figure a long lateral first glume of the pedicellate spikelet in his description of *P. monostachyum*, which is so prominent in our species.

Distributed as *Paspalum schaffneri* Griseb.

\**Panicum viscidellum* Scribn. U. S. Dept. Agr. Div. Agros. Cir. 19: 2 (January, 1900).

A slender, ascending or erect, finally branching perennial, 6 to 10 dm. high, with numerous bearded nodes, pubescent internodes, pubescent sheaths, lanceolate, acute, pubescent leaves, and ovate, exserted panicles 5 to 7 cm. long. Leaves 5 to 8 cm. long, 1 to 2 cm. broad, cordate-clasping at the base; ligule pilose. Panicle branches somewhat viscid, the lower ones 2.5 to 3 cm. long. Spikelets 1.8 mm. long, obovate, obtuse, or subacute, the 7-nerved second and third glumes glabrous or with a few scattering hairs.

Gravelly banks near Jalapa, State of Vera Cruz, altitude 1,250 m., 8089 C. G. Pringle, October, 1899; same locality, 1617 C. L. Smith, 1894; in thickets near Mirador, 323 Liebmann, 1841.

Related to *Panicum scoparium* Lam. (*P. viscidum* Ell.), but stems much more slender, leaves shorter and less rigid, panicles smaller, as are also the spikelets, which are nearly smooth. Fournier, in his enumeration of the grasses of Mexico, refers this grass to *P. commelinæfolium* Rudge,<sup>3</sup> and cites *P. multiflorum* Ell. and *P. microcarpon* "Michx." as synonyms. I have not Rudge's work, "Plante Guianæ," in which *P. commelinæfolium* is illustrated, and upon which illustration Fournier based his determination of Liebmann's plant, but our grass is certainly not *P. multiflorum* Ell. (*P. polyanthes* Schultes), nor does it agree with available descriptions of *P. commelinæfolium*. *P. microcarpon* Ell., Sk. Bot. S. C. and Ga. 127, 1817, not Muhl., is the grass now usually referred to *P. barbulatum* Mx.

<sup>1</sup> Mex. Pl. 2: 13 (1881).

<sup>2</sup> H. B. K. Nov. Gen. et Sp. Pl. 1: 96 (1815).

<sup>3</sup> Mex. Pl. 2: 20 (1881).

**Panicum velutinosum** Nees in Trin. Gram. Panic. 144 (1826).

State of Durango, 2280 J. N. Rose, August 14, 1897; Colima, 149 E. Palmer, August, 1897.

**Oplismenus cristatus** Presl, Rel. Haenk. 1: 323 (1830).

Ometepe Island, Nicaragua, 1075 C. L. Smith, 1894.

**Chætochloa composita** (H. B. K.) Scribn. U. S. Dept. Agr. Div. Agros. Bul. 4: 39 (1897). (*Setaria composita* H. B. K. Nov. Gen. et Sp. Pl. 1: 110 (1815).)

Saltillo, State of Coahuila, 378, 449 E. Palmer, September, 1898; on the road from Casas Grandes to Sabinal, State of Chihuahua, 6368 E. W. Nelson, September 4-5, 1899. Along fence rows, etc.

**Chætochloa grisebachii** (Fourn.) Scribn. U. S. Dept. Agr. Div. Agros. Bul. 4: 39 (1897). (*Setaria grisebachii* Fourn. Mex. Pl. 2: 45 (1881).)

Monte Alban, altitude 1,750 to 1,900 m., near Oaxaca, State of Oaxaca, 939 C. L. Smith, October 8, 1894; Saltillo, State of Coahuila, 385 E. Palmer, September, 1898; Sierra Madre Mountains, 10 miles north of Pachico, State of Chihuahua, 6298 E. W. Nelson, August 25, 1899. A weed in gardens.

**Chætochloa grisebachii ampla** Scribn. & Merrill, U. S. Dept. Agr. Div. Agros. Bul. 21: 36 (1900).

Durango, State of Durango, 728 E. Palmer, September, 1896.

**Chætochloa imberbis** (Poir.) Scribn. U. S. Dept. Agr. Div. Agros. Bul. 4: 39 (1897). (*Panicum imberbe* Poir. in Lam. Encycl. Suppl. 4: 272 (1816).)

Oaxaca, State of Oaxaca, 935 C. L. Smith, 1894.

**Chætochloa imberbis geniculata** (Lam.) Scribn. & Merrill, U. S. Dept. Agr. Div. Agros. Bul. 21: 12 (1900). (*Panicum geniculatum* Lam. Encycl. 4: 727 (1797).)

Jalapa, State of Vera Cruz, 1547 C. L. Smith, 1894; Durango, State of Durango, 378, 381, 539 E. Palmer, July, 1896; Federal District, 6419 C. G. Pringle, 1896; Colotlan, State of Jalisco, 3607 J. N. Rose, August 29, 1897; Colima, 17 E. Palmer, 1897, in rich, shady thickets in a fruit garden.

**Chætochloa latifolia** Scribn. U. S. Dept. Agr. Div. Agros. Bul. 11: 44 pl. 3 (1898). Durango, State of Durango, 879 E. Palmer, November, 1896, growing under bushes in deep ravines.

**Chætochloa latifolia breviseta** Scribn. & Merrill, U. S. Dept. Agr. Div. Agros. Bul. 21: 31 (1900).

Santiago Papasquiaro, State of Durango, 470 E. Palmer, August, 1896, growing under bushes in a deep ravine.

**Chætochloa liebmanni** (Fourn.) Scribn. & Merrill, U. S. Dept. Agr. Div. Agros. Bul. 21: 31 (1900). (*Setaria liebmanni* Fourn. Mex. Pl. 2: 44 (1881).)

Durango, State of Durango, 716 E. Palmer, September, 1896; Rosario, State of Sinaloa, 1840 J. N. Rose, July, 1897; Topolobampo, 233 E. Palmer, September, 1897; Colima, 142 E. Palmer, August, 1897, under bushes on mountain slopes, many plants together.

**Chætochloa liebmanni pauciflora** (Vasey) Scribn. & Merrill, U. S. Dept. Agr. Div. Agros. Bul. 21: 33 (1900). (*Chamæraphis caudata pauciflora* Vasey in Beal, Grasses N. A. 2: 158 (1896).)

Near Acaponeta, Territorio de Tepic, 3303 J. N. Rose, July 31, 1897; Colima, 8 E. Palmer, July, 1897, in shady places on embankments.

**Chætochloa longipila** (Fourn.) Scribn. & Merrill, U. S. Dept. Agr. Div. Agros. Bul. 21: 22 (1900). (*Setaria longipila* Fourn. Mex. Pl. 2: 47 (1881).)

Between Agnacato and Dolores, Territorio de Tepic, 2017 J. N. Rose, August 6, 1897.

**Chætochloa macrostachya** (H. B. K.) Scribn. & Merrill, U. S. Dept. Agr. Div. Agros. Bul. 21: 29 (1900). (*Setaria macrostachya* H. B. K. Nov. Gen. et Sp. Pl. 1: 110 (1815).)

Durango, State of Durango, 872 E. Palmer, November, 1896.

**Chætochloa purpurascens** (H. B. K.) Scribn. & Merrill, U. S. Dept. Agr. Div. Agros. Bul. 21: 13 (1900). (*Setaria purpurascens* H. B. K. Nov. Gen. et Sp. Pl. 1: 90 (1815).)

In the Sierra Madre Mountains, near Santa Teresa, Territorio de Tepic, 3417 J. N. Rose, August 10, 1897; Saltillo, State of Coahuila, 383, 384 E. Palmer, September, 1898.

**Setariopsis auriculata** (Fourn.) Scribn. Field Col. Mus. Bot. Ser. 2: 289 (1896). (*Setaria auriculata* Fourn. Mex. Pl. 2: 43 (1881).)

Bolanos, State of Jalisco, 2899 J. N. Rose, September 10-19, 1897, small form; Colima, 139 E. Palmer, August, 1897, in low places in a graveyard.

**Ixophorus unisetus** (Presl) Schlecht. Linnaea, 31: 420 (1861-62). (*Urochloa unisetis* Presl, Rel. Haenk. 1: 319 (1830).)

Colima, 141 E. Palmer, July 1, 1897, a strong-growing grass found in low places in a graveyard.

**Cenchrus echinatus** L. Sp. Pl. 1050 (1753).

Durango, State of Durango, 880 E. Palmer, October, 1896; Rosario, State of Sinaloa, 3110 J. N. Rose, June 21, 1897; Colotlan, State of Jalisco, 3603 J. N. Rose, August 29, 1897.

**Cenchrus myosuroides** H. B. K. Nov. Gen. et Sp. Pl. 1: 115, t. 35 (1815).

Durango, State of Durango, 868 E. Palmer, November, 1896; near San Juan Capistrano, State of Zacatecas, 2453 J. N. Rose, August 21, 1897.

**Cenchrus tribuloides** L. Sp. Pl. 1050 (1753).

Durango, State of Durango, 196 E. Palmer, June, 1896; near Casas Grandes, State of Chihuahua, 6327 E. W. Nelson, August 30, 1899.

**Pennisetum longistylum** Hochst. Flora, 24: 1 (1841).

Topolobampo, State of Sinaloa, 231 E. Palmer, September, 1897. One bunch of this grass found near a water ditch and said to have been accidentally introduced from Florida.

**Homalocenchrus hexandrus** (Swartz) Britton, Trans. N. Y. Acad. Sci. 9: 14 (1889). (*Leersia hexandra* Swartz, Prodr. Veg. Ind. Occ. 21 (1788).)

Durango, State of Durango, 195 E. Palmer, June, 1896. Wet banks and in shallow water about ponds and lagoons, extending far from the shore by a network of cane-like rootstocks. A very nutritious grass, cattle not only eagerly devouring the short tops, but even keeping their heads under water in order to reach the submerged portions.

**Phalaris canariensis** L. Sp. Pl. 54 (1753).

Rosario, State of Sinaloa, J. N. Rose, no number, July 26-29, 1897, in a yard.

**Savastana mexicana** (Rupr.) Beal, Grasses N. A. 2: 187 (1896). (*Ataxia mexicana* Rupr. Bul. Acad. Brux. 9: 233 (1842); *Hierochloa mexicana* Benth.)

Sierra de San Felipe, altitude 3,075 m., State of Oaxaca, 940 C. L. Smith, August 28, 1894.

**Aristida bromoides** H. B. K. Nov. Gen. et Sp. Pl. 1: 112 (1815).

Saltillo, State of Coahuila, 388 E. Palmer, September, 1898; between Casas Grandes and Sabinal, State of Chihuahua, 6369 E. W. Nelson, September 4-5, 1899; near Sierra En Media, State of Chihuahua, 6466 E. W. Nelson, September 24-26, 1899.

**Aristida dispersa** Trin. & Rupr. Agrost. 3: 109 (1842).

Durango, State of Durango, 535, 767 E. Palmer, September-October, 1896; near Plateado, State of Zacatecas, 2703 J. N. Rose, August 31, 1897; Colotlan, State of Jalisco, 2812 J. N. Rose, September 6, 1897.

**Aristida humboldtiana** Trin. & Rupr. Agrost. 3: 119 (1842).

Pedrigal, Valley of Mexico, Federal District, 6544 C. G. Pringle, October 2, 1896; Serrania de Ajusco, Federal District, 6493 C. G. Pringle, September 6, 1896.

**Aristida interrupta** Cav. Icon. 5: 43 t. 471, f. 2, (1799).

On lava beds, Pedrigal, Valley of Mexico, Federal District, 6579 C. G. Pringle, October 2, 1896.

**Aristida longiramea** Presl, Rel. Haenk. 1: 284 (1830).

Near Sedas, State of Oaxaca, 918 (in part) C. L. Smith, September, 1894.

**Aristida purpurea** Nutt. Trans. Am. Phil. Soc. 5: 145 (1837).

Saltillo, State of Coahuila, 392 E. Palmer, September, 1898. A very slender form, growing among rocks on hillsides.

**Aristida scabra** Kunth, Rev. Gram. 1: 62 (1835).

Santiago Papasquiaro, 472 E. Palmer, August, 1896; about Cuernavaca, State of Morelos, 6496 C. G. Pringle, September 16, 1896; Bolanos, State of Jalisco, 3694 J. N. Rose, September 10-19, 1897; east base of Sierra Madre Mountains, State of Chihuahua, 6496 E. W. Nelson, September 29, 1899.

**Aristida schiedeana** Trin. & Rupr. Agrost. 3: 120 (1842).

Near Plateado, State of Zacatecas, 2793 J. N. Rose, September 4, 1897.

**Aristida setifolia** H. B. K. Nov. Gen. et Sp. Pl. 1: 122 (1815).

Near Sedas, State of Oaxaca, 931, 918 (in part) C. L. Smith, September, 1894.

**Stipa cœrulea** Presl, Rel. Haenk. 1: 227 (1830).

Sierra de San Felipe, altitude 3,075 m., State of Oaxaca, 926 C. L. Smith, September 18, 1894.

**Stipa linearifolia** Fourn. Mex. Pl. 2: 73 (1881) (?).

Saltillo, State of Coahuila, 3 E. Palmer, April, 1898. Distributed as *S. viridula* Trin., from which it is very distinct, and although not agreeing in all particulars with Fournier's description of *S. linearifolia*, there can be but little doubt as to its identity. Empty glumes equal, acuminate, 7 mm. long; flowering glume 5 mm. long, pilose with long appressed hairs; awn scabrous, 1.5-2 cm. long, twisted and twice geniculate. Leaf-blades strongly involute, 2-3 dm. long.

**Stipa trochlearis** Nees in Meyen, Reise, 1: 484 (1843).

Durango, State of Durango, 532 E. Palmer, August, 1896.

**Stipa virescens** H. B. K. Nov. Gen. et Sp. Pl. 1: 126 (1815).

Near Plateado, State of Zacatecas, 2750 J. N. Rose, September 2, 1897.

**Muhlenbergia acuminata** Vasey, Bot. Gaz. 11: 337 (1886).

Saltillo, State of Coahuila, 379 E. Palmer, September, 1898, in rich, moist soil.

**Muhlenbergia affinis** Trin. Agrost. 2: 291 (1841).

Las Sedas, State of Oaxaca, 952 C. L. Smith, September, 1894; on the road between Mesquitec and Monte Escobedo, State of Jalisco, 2614 J. N. Rose, August 26, 1897; Sierra Madre Mountains, west of Bolanos, 2984 J. N. Rose, September 15-17, 1897.

\***Muhlenbergia alamosana** Vasey, Bot. Gaz. 16: 146 (1891).

Mossy cliffs, Sierra de Tepixtlan, near Cuernavaca, altitude 2,300 m., 6994 C. G. Pringle, February 8 and March 14, 1899.

**Muhlenbergia arizonica** Scribn. Bul. Torr. Bot. Club, 15: 8, pl. 76 (1888).

Durango, State of Durango, 536, 713 E. Palmer, August, 1896.

**Muhlenbergia berlandieri** Trin. Agrost. 2: 299 (1841).

Durango, State of Durango, 729 E. Palmer, September, 1896.

**Muhlenbergia calamagrostidea** Kunth, Rev. Gram. 1: 63 (1835).

Durango, State of Durango, 719, 725, 881 E. Palmer, September-October, 1896; near Plateado, State of Zacatecas, 2736 J. N. Rose, September 3, 1897.

**Muhlenbergia capillaris** Trin. Gram. Unifl. 191 (1824).

Sienga, State of Durango, 859, 960 E. Palmer, November, 1896.

**Muhlenbergia debilis** Trin. Gram. Unifl. 193 (1824).

Monte Alban, altitude 1,700 m., near Oaxaca, State of Oaxaca, 938 C. L. Smith, October 8, 1894.

**MUHLENBERGIA DENSIFLORA** Scribn. & Merrill, sp. nov. (Fig. 4.)

An erect, rigid, caespitose perennial, 6 to 9 dm. high, with involute, wiry leaves and dense, contracted panicles 7 to 12 cm. long. Culms cylindrical, glabrous, or

slightly scabrous, especially below the panicle, puberulent below the glabrous nodes; sheaths shorter than the internodes, striate, the lower ones glabrous, the upper scabrous; ligule 5 to 10 mm. long, acute, cleft at the apex; leaf-blades glabrous, rigid, 1 to 3 dm. long, 2 to 3 mm. wide. Panicles somewhat exserted, strict, purplish, about 1 cm. in diameter; rachis angular, scabrous; branches 1 to 2 cm. long, appressed, the lower ones generally remote; pedicels about as long as the spikelets, scabro-pubescent. Spikelets lanceolate, 5 mm. long; empty glumes subequal, 1-nerved, lanceolate, acute or acuminate, 3 to 3.5 mm. long, scabrous on the keel; flowering glume about 5 mm. long, 3-nerved, scabrous on the nerves and keel, bearing a rather stout scabrous awn at the apex, 1 to 3 mm. in length. Palea equaling the flowering glume, lanceolate, acute, or short-apiculate.

Type collected on lava beds, Serania de Ajusco, altitude 3,000 m., Federal District, 6675 C. G. Pringle, August 13, 1897; Sierra de San Felipe, altitude 3,000 m., State of Oaxaca, 4914 C. G. Pringle, September 18, 1894; same locality, C. L. Smith, no number, 1894.

**Muhlenbergia exilis** Fourn. Mex. Pl. 2: 84 (1881).

San Francisco, State of Vera Cruz, 1506 C. L. Smith, 1894; Sierra Madre Mountains, west of Bolanos, State of Jalisco, J. N. Rose, no number, September 16, 1897.

**Muhlenbergia flaviseta** Scribn. U. S. Dept. Agr. Div. Agros. Bul. 8: 11 (1897).

Dos Cajetas, State of Durango, 834 E. Palmer, October, 1896, abundant on the sloping sides of an arroyo.

**Muhlenbergia gracilis** Trin. Gram. Unifl. 193 (1824).

Sierra de San Felipe, altitude 3,075 m., State of Oaxaca, 928, 937 C. L. Smith, September, 1894.

**Muhlenbergia implicata** Trin. Gram. Unifl. 193 (1824).

Durango, State of Durango, 718, 769 E. Palmer, September, 1896.

**Muhlenbergia laxiflora** Scribn. Zoe, 4: 389 (1894).

Durango, State of Durango, 2356 J. N. Rose, August 16, 1897.

**MUHLENBERGIA LIGULATA** (Fourn.) Scribn. & Merrill, n. comb. (*Chaboissia ligulata* Fourn. Mex. Pl. 2: 112, t. — (1881).)



FIG. 4.—*Muhlenbergia densiflora* Scribn. & Merrill: a, Empty glume; b, spikelet; c, flowering glume.

Durango, State of Durango, 731 E. Palmer, September, 1896; 948 E. Palmer, November, 1896, in rich, moist soil in gardens and fields.

The grass here taken to be Fournier's *Chaboissxa ligulata* agrees so closely with the published description and plate of that grass that we have little hesitation in so referring it. The only apparent difference is in the awn of the flowering glume, which in No. 731 E. Palmer is 5 to 6 mm. long. Fournier does not refer to the awn and the illustration shows long-acuminate floral glumes. *Chaboissxa* is placed in the *Poaceæ* by Fournier, but if we have rightly identified Palmer's grass, it certainly belongs to the *Agrostidæ*, and, although the most of the spikelets are 2-flowered, the plant has all the characters of a *Muhlenbergia* and ought to be referred to that genus.

**Muhlenbergia monticola** Buckl. Proc. Acad. Nat. Sci. Phila. **1862:** 91 (1862).

Durango, State of Durango, 528 E. Palmer, August, 1896.

**Muhlenbergia parviflumis** Vasey, Contr. U. S. Nat. Herb. **3:** 71 (1892).

Saltillo, State of Coahuila, 417 E. Palmer, September, 1898. Not common; on very dry hillsides.

**Muhlenbergia porteri** Scribn. in Beal, Grasses N. A. **2:** 259 (1896).

On the road from Casas Grandes to Sabinal, State of Chihuahua, altitude 1,700 m., 6349 E. W. Nelson, September 4-5, 1899.

**Muhlenbergia pringlei** Scribn. Trans. N. Y. Acad. Sci. **14:** 25 (1894).

Durango, State of Durango, 529, 724 E. Palmer, August, 1896; Saltillo, State of Coahuila, 393 E. Palmer, September, 1898.

\***Muhlenbergia setariooides** Fourn. Mex. Pl. **2:** 84 (1886).

Under the spray of the Cascade in Barranca of Texola, near Jalapa, State of Vera Cruz, altitude 1,100 m., 8096 C. G. Pringle, April 30, 1899.

**Muhlenbergia setifolia** Vasey, Bot. Gaz. **7:** 92 (1882).

Saltillo, State of Coahuila, 415 E. Palmer, September, 1898, on dry slopes, rather rare.

**Muhlenbergia texana** Thurb. in Coul. Man. Bot. Rocky Mountain Reg. 410 (1885).

Torreón, State of Coahuila, 511 E. Palmer, October, 1898, in bunches of mesquite bushes; a very wiry species.

**Muhlenbergia vaseyanæ** Scribn. Rept. Mo. Bot. Gard. **10:** 52 (1899). (*M. distichophylla* Am. authors, not Kunth.)

State of Oaxaca, 916 C. L. Smith, 1894; Sierra de San Felipe, altitude 3,075 m., 927 (in part) C. L. Smith, September 18, 1894; Durango, State of Durango, 542 E. Palmer, August, 1896; Sierra Madre Mountains, west of Bolanos, State of Jalisco, 3003 J. N. Rose, September 15-17, 1897.

**Muhlenbergia** sp. Allied to *M. gracilis* Trin., but too young for positive identification.

Sierra Madre Mountains, State of Zacatecas, 3527 J. N. Rose, August 17, 1897.

**Lycurus phleoides** H. B. K. Nov. Gen. et Sp. Pl. **1:** 142 (1815).

Durango, State of Durango, 526 E. Palmer, August, 1896; near Plateado, State of Zacatecas, 2794 J. N. Rose, September 4, 1897; between Casas Grandes and Sabinal, State of Chihuahua, 6356 E. W. Nelson, September 4-5, 1899.

**Sporobolus cryptandrus flexuosus** Thurb. in U. S. Geog. Surv. W. 100th Merid. **6:** 262 (1878).

Colonia Diaz, State of Chihuahua, 6458 E. W. Nelson, September 20-21, 1899.

**Sporobolus dominicensis** Kunth, Enum. Pl. **1:** 214 (1833).

Sierra de San Felipe, State of Oaxaca, 51 C. L. Smith, 1894; Durango, State of Durango, 384, 737 E. Palmer, July, 1896; Topolobampo, State of Sinaloa, 236 E. Palmer, September, 1897, in open bottom lands.

**Sporobolus indicus** (L.) R. Br. Prodr. Fl. Nov. Holl. **1:** 170 (1810). (*Agrostis indica* L. Sp. Pl. 63 (1753).)

- Jalapa, State of Vera Cruz, 1753 C. L. Smith, 1894; Durango, State of Durango, 193 E. Palmer, June, 1896; near Santa Teresa, Territorio de Tepic, 2142 J. N. Rose, 1897; near Plateado, State of Zacatecas, 2708 J. N. Rose, August 31, 1897.
- Sporobolus macrospermus** Scribn. in Beal, Grasses N. A. **2**: 302 (1896).
- Las Sedas, altitude 2,000 m., State of Oaxaca, 921 C. L. Smith, September 29, 1894.
- Sporobolus minutiflorus** Link, Hort. Berol. **1**: 88 (1833).
- On the road between Mesquitec and Monte Escobedo, State of Jalisco, 2613 J. N. Rose, August 26, 1897.
- Sporobolus palmeri** Scribn. U. S. Dept. Agr. Div. Agros. Bul. **11**: 48, pl. 5 (1898).
- Durango, State of Durango, 180 E. Palmer, June, 1896, in large bunches in alkali bottoms.
- Sporobolus piliferus** Kunth, Enum. Pl. **1**: 211 (1833).
- Jalapa, State of Vera Cruz, 1569 C. L. Smith, 1894; fields near Jalapa, State of Vera Cruz, altitude 1,250 m., 7881 C. G. Pringle, 1899.
- Sporobolus utilis** Torr. Pac. R. R. Rept. **5**: 365 (1857). (*Vilfa saccatilla* Fourn. Mex. Pl. **2**: 101 (1881).)
- Durango, State of Durango, 738, 739 E. Palmer, September, 1896.
- Sporobolus wrightii** Scribn. Bul. Torr. Bot. Club, **9**: 103 (1882).
- Durango, State of Durango, 742 E. Palmer, October, 1896; between Rosario and Acaponeta, State of Sinaloa, 1867 J. N. Rose, July 28, 1897; Saltillo, State of Coahuila, 2 E. Palmer, April, 1898; City of Mexico, 4887 Rose and Hough, July 15, 1899; below Pachico, State of Chihuahua, 6243 E. W. Nelson, August 22-24, 1899; near Casas Grandes, State of Chihuahua; 6344 E. W. Nelson, August 30, 1899.
- Blepharoneuron tricholepis** (Torr.) Nash, Bul. Torr. Bot. Club, **25**: 88 (1898). (*Vilfa tricholepis* Torr. Pac. R. R. Rept. **4**: 155 (1857).)
- Dos Cajetas, State of Durango, 833 E. Palmer, October, 1896; Serrania de Ajusco, Federal District, altitude 4,000 m., 6485 C. G. Pringle, 1896.
- Epicampes bourgæi mutica** Fourn. Mex. Pl. **2**: 88 (1881).
- In the Sierra Madre Mountains, west of Bolanos, State of Jalisco, 3002 J. N. Rose, September 15-17, 1899.
- Epicampes pubescens** (H. B. K.) Presl, Rel. Haenk. **1**: 235 (1830). (*Agrostis pubescens* H. B. K. Nov. Gen. et Sp. Pl. **1**: 136 (1815).)
- Sierra de San Felipe, altitude 3,075 m., State of Oaxaca, 927 (in part) C. L. Smith, September 18, 1894. Distributed as *Muhlenbergia distichophylla* Kunth. This species is also represented in the National Herbarium by 5576 C. G. Pringle, 1894, from the same locality.
- Epicampes robusta** Fourn. Mex. Pl. **2**: 89 (1881).
- In the Sierra Madre Mountains, west of Bolanos, State of Jalisco, 2997 J. N. Rose, September 15-17, 1897.
- Polypogon elongatus** H. B. K. Nov. Gen. et Sp. Pl. **1**: 134 (1815).
- Nombre de Dios, State of Durango, 111 E. Palmer, April, 1896; Saltillo, State of Coahuila, 2 E. Palmer, April, 1898; Durango, State of Durango, 162 E. Palmer, June, 1897.
- Cinna poœformis** (H. B. K.) Scribn. & Merrill, n. comb. (*Deyeuxia poœformis* H. B. K. Nov. Gen. et Sp. Pl. **1**: 146 (1815); *Cinnastrum poœforme* Fourn. Mex. Pl. **2**: 91 (1881).)
- Sierra de San Felipe, State of Oaxaca, 936 C. L. Smith, August 28, 1894.
- Agrostis elata** Trin. Agrost. **2**: 364 (1845).
- Near Colonia Garcia, in the Sierra Madre Mountains, State of Chihuahua, 6195 E. W. Nelson, August 1, 1899.
- AGROSTIS ROSEI** Scribn. & Merrill, sp. nov. (Fig. 5.)
- A slender, erect perennial, 4 to 5 dm. high, with short, flat leaves and very open, capillary panicles, 1 to 1.5 dm. long. Culms glabrous, somewhat geniculate at

the lower nodes; sheaths shorter than the internodes, smooth, striate; ligule hyaline, obtuse, 2 mm. long; leaf-blades linear, acuminate, 5 to 8 cm. long, 2 to 3 mm. wide, scabrous on both sides and on the margins. Panicle very open, pale or purplish, the branches capillary, the lower ones verticillate, the upper ones opposite, spreading, dichotomously or verticillately branching, somewhat scabrous, the lower ones 5 to 6 cm. long; pedicels elongated, flexuous. Spikelets about 2 mm. long; empty glumes ovate-lanceolate, acute, subequal, thin, slightly scabrous on the keel above; flowering glume slightly shorter than the

empty glumes, obtuse, often with 2 or 3 blunt teeth at the apex; awn attached near the base, equaling or slightly exceeding the glume, finely scabrous, straight or slightly bent near the middle. Palea very thin, hyaline, lanceolate, obtuse, nearly three-fourths as long as the flowering glume. Grain lanceolate, about 1.5 mm. long.

Type specimen collected on Sierra Madre Mountains, State of Zacatecas, 2373 J. N. Rose, August 18, 1897.

**Agrostis setifolia** Fourn. Mex. Pl. 2: 97 (1881).

Sierra de San Felipe, altitude 3,075 m., State of Oaxaca, 922 C. L. Smith, September 25, 1894.

**Agrostis verticillata** Vill. Prosp. 16 (1779).

Durango, State of Durango, 179 E. Palmer, June, 1896; Nombre de Dios, 95 E. Palmer, April, 1896; Saltillo, State of Coahuila, 806 E. Palmer, September, 1898, in low, wet places along ditches.

**Agrostis virletii** Fourn. Mex. Pl. 2: 96 (1881).

Durango, State of Durango, 190 E. Palmer, June, 1896, very abundant in low, wet places in alkali bottoms.

\***Avena micrantha** Scribn. U. S.

Dept. Agr. Div. Agros. Cir. 19: 3, fig. 1 (January 1, 1900). (Fig. 6.)

A very slender, densely caespitose, upright perennial, 2.5 to 3.5 dm. high, with soft leaves 6 to 15 cm. long, 1 to 2 mm. wide, ligules 5 to 6 mm. long, and loosely flowered simple panicles 5 to 7 cm. long. Sheaths glabrous; leaves pubescent above, smooth beneath, becoming involute when dry; branches of the panicle capillary, spreading or ascending, 1 to 3 flowered, the longer lower branches 1 to 3 cm. long; empty glumes unequal, lanceolate, the first about 8 mm. long, 1-nerved, the second about as long as the flowering glume, 3-nerved near the base, thin-membranous and abruptly pointed; flowering glumes glabrous, 5-nerved, rounded



FIG. 5.—*Agrostis rosei* Scrib. & Merrill: a, a spikelet; b, the awned flowering glume and palea; c, the grain.

on the back, 2-toothed at the apex, the teeth awn-like; callus rather densely bearded, hairs stiff, the longer ones 3 to 4 mm. long; awn arising below the apex of the flowering glume, slender, geniculate, twisted below the geniculation, about 17 mm. long. Palea as long as the flowering glume, rather rigid, margins rounded, inflexed, apex subhyaline, the two nerves extending into subulate, awn-like teeth.

Cool, mossy cliffs, Sierra de Tepixtlan, near Cuernavaca, State of Morelos, altitude 2,300 m., 8018 C. G. Pringle, February 5, 1899.

\**Avena stipoides* Scribn. U. S. Dept. Agr. Div. Agros. Cir. 19: 4 (January, 1900).

A very slender, erect, somewhat wiry perennial, 5 to 6 dm. high, with linear, erect leaves and loosely few-flowered,

simple panicles 5 to 10 cm. long. Sheaths shorter than the internodes, very minutely strigose-pubescent; ligule 5 to 8 mm. long, hyaline; leaves involute-setaceous, at least when dry, 1 to 2.5 mm. wide, 1 to 2 dm. long, scabrous. Spikelets about 12 mm. long, exclusive of the awn; empty glumes unequal, thin, scarious, 1-nerved, acute, the first about 4 mm. long, the second 5.5 mm. long; flowering glume 11 mm. long, 5-nerved, slightly roughened on the nerves above, 2-toothed at the apex, teeth awn-like, awned on the back below the 2-toothed apex; awn geniculate, twisted below, attached about two-thirds above the base, 12 to 14 mm. long. Palea equaling the glume, the two nerves extending into subulate, awn-like teeth. Callus hairs 1 to 2 mm. long.

Sierra de San Felipe, State of Oaxaca, altitude 3,130 m., 4905 C. G. Pringle, September 19, 1894; 923 C. L. Smith, August 28, 1894. Distributed as *Muhlenbergia stipoides* Trin.

This grass is closely allied to *Avena micrantha*, 8018 C. G. Pringle, but is at once distinguished by its shorter empty glumes.

The strictly 1-flowered spikelets of this and the last species is a character which would lead one to place these grasses in the tribe *Agrostideae*; but the densely hairy callus and rather rigid 5-nerved flowering glume, which is deeply 2-toothed at the apex, and the dorsal, geniculate, and twisted awn formed by the union of three of the nerves suggest relationship with *Avena*, as does the character of the empty glumes, and these species are tentatively placed in that genus.

**TRISTACHYA AVENACEA** (Presl) Scribn. & Merrill, n. comb. (*Monopogon avenaceus* Presl, Rel. Haen. 1: 335, t. 44 (1830); *Tristachya mexicana* Kunth, Enum. Pl. 1: 308 (1833).)

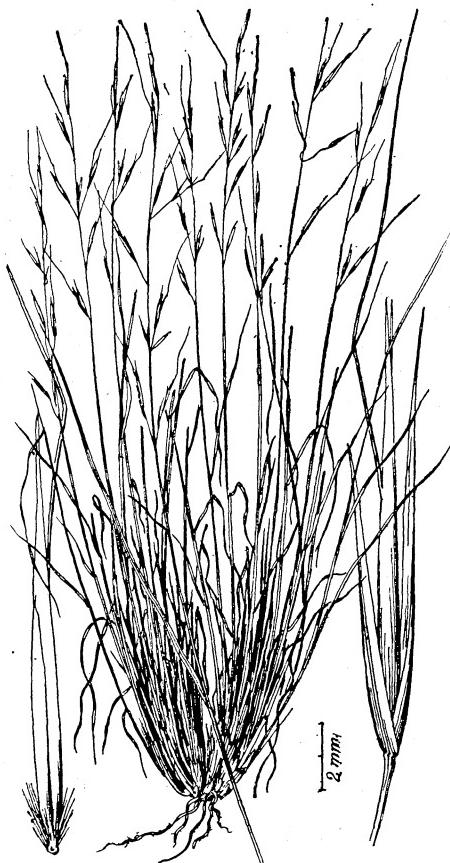


FIG. 6.—*Avena micrantha* Scribn.

This plant has been referred to the South American *Tristachya leiostachya* Nees, from which it is readily distinguished by its more slender habit, plane, not involute leaves, and shorter spikelets and awns. The spikelets of *T. leiostachya* are 5 cm. long and the awns are about 12 cm. long. In *T. avenacea* the spikelets are from 2 to 3.5 cm. long and the awns do not exceed 6 cm. in length.

Near Santa Teresa, Sierra Madre Mountains, Territorio de Tepic, 2229 J. N. Rose, August 13, 1897.

**TRISTACHYA LAXA** Scribn. & Merrill, sp. nov. (Fig. 7.)

A stout, erect perennial, 15 to 20 dm. high, with long leaves, scabrous spikelets, and

very lax panicles 4 to 5 dm. in length. Culms rigid, glabrous, about 1 cm. in diameter at the base; nodes smooth; sheaths striate, the lower ones numerous, imbricate, sparingly pubescent, the upper scabrous; ligule a dense ciliate fringe of soft hairs about 2 mm. long; leaf-blades involute or folded below, plane above, 4 to 7 dm. long, 5 to 10 mm. wide, glabrous beneath, scabrous on the upper surface and margins, somewhat bearded at the throat. Panicle very lax, the lower portion somewhat inclosed by the uppersheath; rachis smooth; branches alternate, the lower ones in clusters of twos at each node, solitary above, somewhat pubescent at the axils, very slender, the lower ones 2 dm. long, simple or once branched above the middle. Spikelets short-pedicellate, in clusters of threes at the end of the branches, 1.5



FIG. 7.—*Tristachya laxa* Scribn. & Merrill: a, a group of spikelets; b, a single floret.

to 2 cm. long; empty glumes purple, 3-nerved, acute, the first slightly shorter than the second, strongly scabrous on the keel and lateral nerves, slightly scabrous on the margins; third glume nearly equaling and inclosed by the first glume, 5-nerved, subtending a hyaline palea nearly its own length and a staminate flower, flowering glume 8 to 9 mm. long, 9-nerved, pubescent throughout with spreading white hairs, apex cleft, forming 2 acute teeth about 2 mm. long and bearing between them a scabrous, geniculate awn 2 to 2.5 cm. in length, which is twisted below the geniculation, straight above.

Type collected in the State of Durango, 2334 J. N. Rose, August 16, 1897. Readily distinguished from the other species in this genus by its stout culms, lax panicles, long capillary branches, scabrous empty glumes, and long sterile palea.

**Microchloa indica** (L. f.) Kuntze, Rev. Gen. Pl. 3<sup>2</sup>: 356 (1898). (*Nardus indica* L. f. Suppl. Pl. 105 (1781); *Microchloa setacea* R. Br. Prodr. Fl. Nov. Holl. 1: 208 (1810).)

Durango, State of Durango, 532 E. Palmer, August, 1896.

**Cynodon dactylon** Pers. Syn. Pl. 1: 85 (1805).

Saltillo, State of Coahuila, 254 E. Palmer, June, 1898; 814 E. Palmer, October, 1898.

**CHLORIS CLANDESTINA** Scribn. & Merrill, nom. nov. (*Gymnopogon longifolius* Fourn. Mex. Pl. 2: 144 (1881); *Chloris longifolia* Vasey, Contr. U. S. Nat. Herb. 1: 284, pl. 19 (1893), not Steud. Syn. Pl. Gram. 205 (1854).)

Topolobampo, State of Sinaloa, 238 E. Palmer, September, 1897, in small bunches under other plants in bottom lands.

**Chloris elegans** H. B. K. Nov. Gen. et Sp. Pl. 1: 166 (1815).

Durango, State of Durango, 176 E. Palmer, June, 1896; 765 E. Palmer, October, 1896; near Colotlan, State of Jalisco, 3604 J. N. Rose, August 29, 1897; Colima, 140 E. Palmer, September, 1897; Topolobampo, State of Sinaloa, 245 E. Palmer, September, 1897; Parras, State of Coahuila, 448 E. Palmer, October, 1898; on the road from Casas Grandes to Sabinal, State of Chihuahua, 6354 E. W. Nelson, September 4-5, 1899, in open bottom lands, among cacti and other plants.

**Chloris submutica** H. B. K. Nov. Gen. et Sp. Pl. 1: 167, t. 50 (1815).

Durango, State of Durango, 181 E. Palmer, June, 1896; in the Sierra Madre Mountains, near Santa Teresa, Territorio de Tepic, 2143 J. N. Rose, August 9, 1897; Saltillo, State of Coahuila, 390 E. Palmer, September, 1898.

**Bouteloua aristidoides** (H. B. K.) Griseb. Fl. Brit. W. Ind. 537 (1864). (*Dinebra aristidoides* H. B. K. Nov. Gen. et Sp. Pl. 1: 171 (1815).)

Durango, State of Durango, 717 E. Palmer, September, 1896; near San Juan Capistrano, State of Zacatecas, 2490 J. N. Rose, August 23, 1897; Topolobampo, State of Sinaloa, 237 E. Palmer, September, 1897; Torreon, State of Coahuila; 513 E. Palmer, October, 1898; near Casas Grandes, State of Chihuahua, 6329 E. W. Nelson, August 30, 1899.

**Bouteloua bromoides** (H. B. K.) Lag. Gen. et Sp. Nov. 5 (1816). (*Dinebra bromoides* H. B. K. Nov. Gen. et Sp. Pl. 1: 172, t. 51 (1815).)

Between Monte Escobedo and Colotlan, State of Jalisco, 2672 J. N. Rose, August 28, 1897; near Pachico, State of Chihuahua, 6258 E. W. Nelson, August 22-24, 1899; Sierra Madre Mountains, 10 miles north of Pachico, 6305 E. W. Nelson, August 25, 1899.

**Bouteloua curtipendula** (Michx.) Torr. in Emory, Notes Mil. Recon. 153 (1848). (*Chloris curtipendula* Michx. Fl. Bor. Am. 1: 59 (1803); *B. racemosa* Lag. Varied. Cienc. Lit. Art. 2<sup>4</sup>: 14 (1805).)

Monte Alban, near Oaxaca, State of Oaxaca, 958 C. L. Smith, September 5, 1894; Bolanos, State of Jalisco, 2929 J. N. Rose, September 10-19, 1897; Durango, State of Durango, 194 E. Palmer, June, 1896; Saltillo, State of Coahuila, 407 E. Palmer, September, 1898; below Pachico, State of Chihuahua, 6247 E. W. Nelson, August 22-24, 1899.

**Bouteloua havardi** Vasey, Proc. Am. Acad. 18: 179 (1883).

Durango, State of Durango, 546 E. Palmer, August, 1896; near Huejuquilla, State of Jalisco, 2532 J. N. Rose, August 24, 1897; near Plateado, State of Zacatecas, 2782 J. N. Rose, September 3, 1897.

**Bouteloua hirsuta** Lag. Varied. Cienc. Lit. Art. 2<sup>4</sup>: 141 (1805).

Durango, State of Durango, 870 E. Palmer, November, 1896; between Concepcion and Acaponeta, 1904 J. N. Rose, July 29, 1897; near Acaponeta, Territorio de Tepic, 3293 J. N. Rose, July 30, 1897; on the road between Huejuquilla and Mesquitec,

State of Jalisco, 2586 J. N. Rose, August 25, 1897; Saltillo, State of Coahuila, 405 E. Palmer, September, 1898; near Pachico, State of Chihuahua, 6246 E. W. Nelson, August 22-24, 1899.

**Bouteloua oligostachya** Torr. in A. Gray, Man. Bot. ed. 2, 553 (1856).

Durango, State of Durango, 545 E. Palmer, August, 1896; Saltillo, State of Coahuila, 399, 403, 406 E. Palmer, September, 1898; near Casas Grandes, State of Chihuahua, 6327 E. W. Nelson, August 30, 1899.

**Bouteloua polystachya** Torr. Pac. R. R. Rept. 5<sup>2</sup>: 366, t. 10 (1847).

San Antonio Valley, State of Oaxaca, 957 C. L. Smith, September 1, 1894; Durango, State of Durango, 714 E. Palmer, September, 1896; Torreon, State of Coahuila, 514 E. Palmer, October, 1898; Saltillo, 401 E. Palmer, September, 1898.

**Bouteloua ramosa** Scribn. in Vasey, U. S. Dept. Agr. Div. Bot. Bul. 12<sup>1</sup>: 44, pl. 44 (1891).

Saltillo, State of Coahuila, 404 E. Palmer, September, 1898, in close tufts in low places on the mesa.

**BOUTELOUA REPENS** (H. B. K.) Scribn. & Merrill, n. comb. (*Dinebra repens* H. B. K. Nov. Gen. et Sp. Pl. 1: 172, t. 52 (1815).)

Durango, State of Durango, 547 E. Palmer, August, 1896.

**Bouteloua tenuis** Griseb. in Goett. Abh. 24: 303 (1879).

Durango, State of Durango, 712 E. Palmer, September, 1896; Saltillo, State of Coahuila, 397, 378 E. Palmer, September, 1898; Pedrigal, Valley of Mexico, Federal District, 6450 C. G. Pringle, August 20, 1896. This grass grows so abundantly on the mesquite plains that it gives them the appearance of a lawn.

**Bouteloua trifida** Thurb. Proc. Am. Acad. 18: 177 (1883).

Saltillo, State of Coahuila, 402 E. Palmer, September, 1898.

**Pentarrhaphis fournierana** Hack. & Scribn. Bul. Torr. Bot. Club, 17: 232, pl. 107 (1890).

Durango, State of Durango, 382 E. Palmer, July, 1896; between Acaponeta and Rosario, J. N. Rose, no number, July 6, 1897; between Rosario and Colomas, State of Sinaloa, 1621 J. N. Rose, July 12, 1897; near Tequila, State of Jalisco, 4775 Rose and Hough, July 5-6, 1899.

**Eleusine indica** Gaertn. Fruct. et Sem. 1: 8 (1788).

Coatzacoalcos, isthmus of Tehuantepec, State of Vera Cruz, 1050 C. L. Smith, March 16, 1895.

**Dactyloctenium aegyptium** (L.) Willd. Enum. 1029 (1809). (*Cynosurus aegyptius* L. Sp. Pl. 72 (1753).)

Durango, State of Durango, 735 E. Palmer, September, 1896; between Rosario and Acaponeta, State of Sinaloa, 1877 J. N. Rose, July 25, 1897; Coatzacoalcos, isthmus of Tehuantepec, State of Vera Cruz, 1055 C. L. Smith, February 1, 1895; Colima, 10, 11, 167, 168 E. Palmer, July, 1897; Topolobampo, State of Sinaloa, 246 E. Palmer, September, 1897.

**LEPTOCHLOA AQUATICA** Scribn. & Merrill, sp. nov.

An erect, glabrous, branching perennial about 7 dm. high, with smooth culms, flat leaves, and obtuse flowering glumes. Culms much branched below, striate, cylindrical, rooting at the lower nodes; nodes brown, smooth; sheaths loose, longer than the internodes, the lower ones compressed, smooth or minutely roughened; ligule 1 to 2 mm. long, fimbriate; leaf-blades thin, linear-lanceolate, 10 to 20 cm. long, 5 to 8 mm. wide, slightly scabrous or nearly smooth on both sides, scabrous on the margins. Panicles 10 to 12 cm. long, green; common axis smooth or slightly roughened above, striate; branches erect, 2 to 5 cm. long, alternate, scabrous, floriferous throughout. Spikelets ovate-lanceolate, rather loosely 3 to 4 flowered, about 5 mm. long, on short scabrous pedicels about 1 mm. in length; empty glumes very unequal, 1-nerved, slightly scabrous on the keels, the first about 1 mm. long, narrowly triangular-lanceolate, acute,

the second 2 mm. long, broad, rhomboidal, triangular-acute at the apex; flowering glumes about 3 mm. long, broadly ovate (when spread), obtuse, awnless, glabrous except on the scabrous keel, 3-nerved, the middle nerve prominent, percurrent, the lateral ones marginal, extending about two-thirds the length of the glume, slightly pilose. Palea equaling the glumes, lanceolate-spatulate, truncate, and slightly denticulate at the apex, sparingly pilose on the margins below.

Type specimen collected in shallow water near Cuernavaca, State of Morelos, altitude 1,700 m., 6664 C. G. Pringle, August 22, 1897.

In habit very much resembling *Leptochloa halei*, but at once distinguished from that species by its more unequal empty glumes and obtuse awnless flowering glumes.

**Leptochloa dubia** Nees, Syllog. Ratisb. 1: 4 (1824).

Santiago Papasquiaro, State of Durango, 468 E. Palmer, August, 1896; Durango, 530 E. Palmer, August, 1896; Saltillo, State of Coahuila, 381, 382 E. Palmer, September, 1898.

**LEPTOCHLOA DUBIA PRINGLEANA** (Kuntze) Scribn. & Merrill, n. comb.  
(*Diplachne dubia pringleana* Kuntze, Rev. Gen. Pl. 3: 349 (1898).)

Hills and plains near Chihuahua, 422 C. G. Pringle, August, 1885.

**Leptochloa fascicularis** (Lam.) A. Gray, Man. Bot. ed. 5, 623 (1867).

Durango, State of Durango, 254 E. Palmer, June, 1896; Torreon, State of Coahuila, 503 E. Palmer, October, 1898, rich, moist ground, along ditches subject to overflow.

**Leptochloa filiformis** Presl, Rel. Haenk. 1: 288 (1830).

Topolobampo, State of Sinaloa, 248 E. Palmer, September, 1897, common on bottom lands.

**LEPTOCHLOA HALEI** (Nash) Scribn. & Merrill, n. comb. (*Diplachne halei* Nash, Bul. N. Y. Bot. Gard. 1: 292 (1899).)

Foothills between Acaponeta and Pedro Paulo, Territorio de Tepic, 1930 J. N. Rose, August 2, 1897.

This species can scarcely be distinct from *Leptochloa floribunda*, Doell,<sup>1</sup> although the details as drawn in the plate representing that species do not agree with our specimens of *Leptochloa halei* nor with those of authentic material of *Leptochloa floribunda*. There is in the U. S. National Herbarium one sheet of Hale's Louisiana collection and two sheets from the Herbarium Hookerianum, the latter labelled "Leptochloa floribunda Doell. Ad ripas fluminis Amazonum inter Santarem et Barra de Rio Negro, Coll. R. Spruce, October, 1850," and also in what is evidently Bentham's handwriting "Texas, Drummond, No. 322 ex herb. T. C. D(rummond) is identical with this." No. 322 Drummond is cited by Nash as the type of *Diplachne halei*.

Doell cited as the type of his species "ad ripas fluminis Amazonum inter Manos et Santarem (Spruce)," and although the material in the National Herbarium may not be of the collection on which *Leptochloa floribunda* is based, there can be no doubt but that it is typical.

A careful comparison of the specimens collected by Hale in Louisiana and those collected by Spruce in Brazil proves conclusively that they are the same, and the only hesitation we have in not referring *Diplachne halei* to *Leptochloa floribunda* is the fact that details of the latter as drawn by Doell differ somewhat from both our North and South American material.

**Leptochloa mucronata** Kunth, Rev. Gram. 1: 91 (1835).

Rosario, State of Sinaloa, 1542 J. N. Rose, July 7, 1897; San Jose de Guaymas, 270 E. Palmer, October 14, 1897; Colima, 22 E. Palmer, July, 1897.

**Pappophorum apertum** Munro, Bul. Torr. Bot. Club, 9: 148 (1882).

Saltillo, State of Coahuila, 256 E. Palmer, June, 1898; 377 E. Palmer, September, 1898.

<sup>1</sup> Mart. Fl. Bras. 3<sup>2</sup>: 89, pl. 26 (1878).

**Pappophorum wrightii** Wats. Proc. Am. Acad. **18**: 178 (1882-83).

Durango, State of Durango, 721 E. Palmer, September, 1896; Saltillo, State of Coahuila, 395 E. Palmer, September, 1898.

**Cottea pappophoroides** Kunth, Rev. Gram. **1**: 84, 281, *t. 52* (1835).

Bolanos, State of Jalisco, 2914 J. N. Rose, September 10-19, 1897.

**Cathestecum prostratum** Presl, Rel. Haenk. **1**: 295, *t. 42* (1830).

San Antonio Valley, State of Oaxaca, 958 C. L. Smith, 1894; Colima, 12 E. Palmer, July, 1897; between Huejuquilla and Mesquitec, State of Jalisco, 2582 J. N. Rose, August 25, 1897; a close compact-growing grass with long runners, forming a fine, close sod; spots of considerable size are found covered with it.

**Cathestecum** sp.

Monte Alban, State of Oaxaca, 950 C. L. Smith, 1894. This specimen is doubtfully referred to *Cathestecum*, but is very distinct from both *C. prostratum* Presl and *C. erectum* Vasey and Hack, and is seemingly intermediate between the genera *Cathestecum* and *Pentarrhaphis*. The material in the National Herbarium is in a too unsatisfactory condition for accurate determination.

**Scleropogon brevifolius** Philippi, Sert. Mendoc. **2**: 48 (1871).

Saltillo, State of Coahuila, 386 E. Palmer, September, 1898, common on dry hills.

**Monanthochloe littoralis** Engelm. Trans. Acad. Sci. St. Louis, **1**: 436. *tt. 13, 14* (1859).

Altata, State of Sinaloa, 1370 J. N. Rose, June 15, 1897.

**Munroa squarrosa** (Nutt.) Torr. Pac. R. R. Rept. **4<sup>b</sup>**: 158 (1857). (*Crypsis squarrosa* Nutt. Gen. **1**: 49 (1818).)

Colonia Diaz, State of Chihuahua, 6440 E. W. Nelson, September 20-21, 1899.

**Triodia acuminata** Benth. in Vasey, U. S. Dept. Agr. Div. Bot. Spec. Rept. **63**: 35 (1883).

Saltillo, State of Coahuila, 262 E. Palmer, June, 1898, 813 E. Palmer, September, 1898, in dense tufts on dry rocky hills.

**Triodia avenacea** H. B. K. Nov. Gen. et Sp. Pl. **1**: 156, *t. 48* (1815).

Saltillo, State of Coahuila, 414 E. Palmer, September, 1898, on rocky hillsides, forming dense tufts.

**Triodia pulchella** H. B. K. Nov. Gen. et Sp. Pl. **1**: 155, *t. 47* (1815).

Durango, State of Durango, 740 E. Palmer, September, 1896; Saltillo, State of Coahuila, 257 E. Palmer, June, 1898, 413 E. Palmer, September, 1898; near Lake Santa Maria, State of Chihuahua, 6414 E. W. Nelson, September 7, 1899.

**Eragrostis ciliaris** (L.) Link, Hort. Berol. **1**: 192 (1827).

Acaponeta, Territorio de Tepic, 3135 J. N. Rose, June 23-30, 1897.

**Eragrostis glomerata** (Walt.) Dewey, Contr. U. S. Nat. Herb. **2**: 543 (1894). (*Poa glomerata* Walt. Fl. Car. 80 (1788); *Eragrostis conferta* Trin.) Near Cuernavaca, State of Morelos, 6605 C. G. Pringle, 1896.

**Eragrostis limbata** Fourn. Mex. Pl. **2**: 116 (1881).

On the road from Casas Grandes to Sabinal, State of Chihuahua, altitude 1,700 m., 6353 E. W. Nelson, September 4-5, 1899; plains near Sierra En Media, State of Chihuahua, 6466 E. W. Nelson, September 24-26, 1899.

**Eragrostis lugens** Nees, Agrost. Bras. 507 (1829).

Durango, State of Durango, 727 E. Palmer, September, 1896; Saltillo, State of Coahuila, 408 E. Palmer, September, 1898, a showy grass, growing in rich soil where stock could not reach it.

**Eragrostis major** Host, Gram. **4**: *t. 24* (1809).

Durango, State of Durango, 720 E. Palmer, September, 1896; Saltillo, State of Coahuila, 389 E. Palmer, September, 1898, in rich soil about dwellings, in gardens, etc.

**Eragrostis mexicana** Link, Hort. Berol. **1**: 190 (1827).

Durango, State of Durango, 531, 768, 875, E. Palmer, June-November, 1896; Colima, 20 E. Palmer, July, 1897; Torreon, State of Coahuila, 510 E. Palmer, October, 1898; Saltillo, 376, 409, 411 E. Palmer, September, 1898.

- Eragrostis neo-mexicana** Vasey, in Beal, Grasses N. A. **2**: 485 (1896).  
 Near Colotlan, State of Jalisco, 3605 J. N. Rose, August 29, 1897; Saltillo, State of Coahuila, 410, 412 E. Palmer, September, 1898; Sierra Madre Mountains, north of Pachico, State of Chihuahua, 6300 E. W. Nelson, August 25, 1899.
- Eragrostis panamensis** Presl, Rel. Haenk. **1**: 277 (1830).  
 Coatzaocoalcos, Isthmus of Tehuantepec, State of Vera Cruz, 1051 C. L. Smith, February, 1895, a robust form, distributed as *Eragrostis major* Host.
- Eragrostis pilosa** (L.) Beauv. Agrost. 71 (1812).  
 Durango, State of Durango, 726 E. Palmer, September, 1896; Saltillo, State of Coahuila, 811 E. Palmer, September, 1898.
- Eragrostis plumosa** Link, Hort. Berol. **1**: 192 (1827).  
 Colima, 15 E. Palmer, July, 1897, along roadsides, shady ravines, and in gardens.
- Eragrostis purshii** Schrad. Linnaea, **12**: 451 (1838).  
 Durango, State of Durango, 177, 183, 534, 723, 764, 869 E. Palmer, June–October, 1896; Rosario, State of Sinaloa, 1544, 1545 J. N. Rose, July 7, 1897, 1847 J. N. Rose, July 26, 1897; Guaymas, State of Sonora, 1281 J. N. Rose, June 5–11, 1897; Bolanos, State of Jalisco, 3699 J. N. Rose, September 10–19, 1897; between Agnacata and Dolores, Territorio de Tepic, 2016 J. N. Rose, August 6, 1897; Colima, 13 E. Palmer, 1897; Topolobampo, State of Sinaloa, 240 E. Palmer, September, 1897; Saltillo, State of Coahuila, 812 E. Palmer, September, 1898.
- Eragrostis sessilispica** Buckl. Proc. Acad. Nat. Sci. Phila. **1862**: 97 (1862).  
 Near Lake Santa Maria, State of Chihuahua, 6413 E. W. Nelson, September 7, 1899.
- Eatonia obtusata** A. Gray, in S. Wats. Bot. Calif. **2**: 302 (1880).  
 Durango, State of Durango, 255 E. Palmer, June, 1896.
- Koeleria cristata** (L.) Pers. Syn. **1**: 97 (1805). (*Aira cristata* L. Sp. Pl. 63 (1753).)  
 Near Colonia Garcia, Sierra Madre Mountains, State of Chihuahua, 6198 E. W. Nelson, August 1, 1899.
- Distichlis prostrata** (H. B. K.) Desv. Gram. Chil. 398 (1853). (*Poa prostrata* H. B. K. Nov. Gen. et Sp. Pl. **1**: 157 (1815).)  
 Durango, State of Durango, 182, 385(?), 388 E. Palmer, 1898, common in damp, alkali meadows.
- Distichlis spicata** (L.) Greene, Bul. Calif. Acad. Sci. **2**: 415 (1887). (*Uniola spicata* L. Sp. Pl. 71 (1753).)  
 Altata, State of Sinaloa, 1367 J. N. Rose, June 15, 1897; San Jose de Guaymas, 270 E. Palmer, October 14, 1897; near Lake Santa Maria, State of Chihuahua, 6461 E. W. Nelson, September 7, 1899. This grass is planted along ditches in sandy soil to prevent banks from washing.
- Distichlis texana** (Vasey) Scribn. U. S. Dept. Agr. Div. Agros. Bul. **17**: 236, fig. 532 (1899). (*Poa texana* Vasey, Contr. U. S. Nat. Herb. **1**: 60 (1890); *Sieglingia wrightii* Vasey, Contr. U. S. Nat. Herb. **1**: 269 (1893).)  
 Torreon, State of Coahuila, 507 E. Palmer, October, 1898, growing on sandy banks of the Nassus River.
- Poa annua** L. Sp. Pl. 68 (1753).  
 Nombre de Dios, State of Durango, 97 E. Palmer, April, 1896; Saltillo, State of Coahuila, 6 E. Palmer, April, 1899, about dwellings.
- Poa infirma** H. B. K. Nov. Gen. et Sp. Pl. **1**: 158 (1815).  
 Near Plateado, State of Zacatecas, 2712 J. N. Rose, September 1, 1897.
- \***Poa pratensis** L. Sp. Pl. 67 (1753).  
 Mountains near Jalapa, State of Vera Cruz; altitude, 1,750 m.; 7880 C. G. Pringle, April–May, 1899.
- Graphephorum altijugum** Fourn. Bul. Soc. Bot. Fr. **24**: 182 (1877).  
 Sierra de San Felipe, State of Oaxaca, 941 C. L. Smith, 1894.
- Festuca amplissima** Rupr. Bul. Acad. Brux. **9<sup>2</sup>**: 236 (1842).  
 Sierra de San Felipe, State of Oaxaca, 924 C. L. Smith, September, 1894; Durango, State of Durango, 2358 J. N. Rose, August 16, 1897, small form.

**Bromus carinatus arizonicus** Shear, U. S. Dept. Agr. Div. Agros. Bul. **23**: 61 (1900).

Sierra Madre Mountains, near Santa Teresa, Territorio de Tepic, 2138 J. N. Rose, August 9, 1897.

**Bromus ciliatus** L. Sp. Pl. 76 (1753).

Sierra de San Felipe, altitude 3,075 m., State of Oaxaca, 925 C. L. Smith, September, 1894.

**Bromus compressus** Lag. Elench. 4 (1816).

Saltillo, State of Coahuila, 5 E. Palmer, April, 1898; 366 E. Palmer, September, 1898, in alfalfa, along irrigating ditches.

**Bromus laciniatus** Beal, Grasses N. A. **2**: 615 (1896).

Sierra de San Felipe, State of Oaxaca, 942 C. L. Smith, September, 1894.

**Bromus porteri frondosus** Shear, U. S. Dept. Agr. Div. Agros. Bul. **23**: 37 (1900). Near Plateado, State of Zacatecas, 2727 J. N. Rose, September 1, 1897.

**BROMUS SCHAFFNERI** (Fourn.) Scribn. & Merrill, n. comb. (*Bromus hookeri schaffneri* Fourn. Mex. Pl. **2**: 127 (1881).)

Durango, State of Durango, 171 E. Palmer, June, 1896, 743 E. Palmer, September, 1896.

**Agropyron arizonicum** Scribn. & Smith, U. S. Dept. Agr. Div. Agros. Bul. **4**: 27 (1897).

Base of Sierra Madre Mountains, State of Chihuahua, near the border of Mexico, 6495 E. W. Nelson, September 29, 1899.

**Elymus brachystachys** Scribn. & Ball. (p. 47).

Saltillo, State of Coahuila, 260 E. Palmer, June, 1898.

**ELYMUS PRINGLEI** Scribn. & Merrill, sp. nov.

A slender, erect, cespitose perennial, 6 to 9 dm. high, with slender culms, linear or linear-lanceolate leaves and rather loosely flowered, pale green panicles 4 to 12 cm. long. Culms very slender, glabrous, often somewhat geniculate below; nodes smooth; sheaths smooth, striate, mostly shorter than the internodes; ligule hyaline, obtuse, slightly toothed, about 1 mm. long; leaf-blades 10 to 20 cm. long, 3 to 8 mm. wide, scabrous on both sides. Rachis somewhat compressed, slightly scabrous, somewhat strigose above, the internodes shorter than the spikelets. Spikelets 2 at each node, 3 to 4 flowered, about 10 mm. long, exclusive of the awns; empty glumes subequal, scabrous, subulate-setaceous, about 22 mm. long; flowering glumes lanceolate, acuminate, 5-nerved, strigose-pubescent, with rather short, stiff hairs, especially above, bearing a straight, slender, scabrous awn 8 to 15 mm. long. Palea lanceolate, obtuse, strongly serulate-scabrous on the margins above, 7 to 8 mm. long.

Type specimen collected in wet soil in a valley near Tula, State of Hidalgo, altitude 2,200 m., 6637 C. G. Pringle, June 8, 1897, distributed as *Elymus botteri*; 7165 C. G. Pringle, same locality, October 24, 1896, belongs here.

This species differs from *E. interruptus* Buckl. in its slender habit, narrower, setaceous empty glumes, and strongly strigose-pubescent flowering glumes.

\***Sitanion brevifolium** J. G. Smith, U. S. Dept. Agr. Div. Agros. Bul. **18**: 17 (1899).

Cerro Ventoso, above Pachuca, State of Hidalgo, altitude 2,600 m., 6944 C.G. Pringle, August 18, 1899.

**Arundinaria longifolia** Fourn. Mex. Pl. **2**: 131 (1881).

Between Pedro Paulo and San Blascito, Territorio de Tepic, 3344 J. N. Rose, August 4, 1897; near Huasemote, State of Durango, 3494 J. N. Rose, August 15, 1897.

## II.—NOTES ON PANICUM NITIDUM LAM., PANICUM SCOPARIUM LAM., AND PANICUM PUBESCENS LAM.

By F. LAMSON-SCRIBNER and ELMER D. MERRILL.

While in Paris in March and April, 1900, Mr. A. H. Baldwin, an artist of the Department, made careful drawings and notes on some of Michaux's and Lamarck's types in the Herbarium of the Muséum d'Histoire Naturelle de Paris, and among them were found the types or at least typical material of *Panicum nitidum*, *Panicum pubescens*, and *Panicum scoparium*. As none of these species have been understood by American authors, the following notes on the results of studying these types will clear up the existing confusion regarding the identity of these species. F. L.-S.

### PANICUM NITIDUM Lam.

Lamarck first characterized *Panicum nitidum* in his *Tabl. Encycl. 1: 172 (1791)*, as follows:

"899. *Panicum nitidum*.

"*P. panicula ramosa subviolacea, glumis obtusis striatis, semine nitido.*

"*E Carolinia Com. D. Fraser.*"

Later in his *Encycl. 4: 738 (err. typ. 748) (1797)*, he more fully characterized the species with the following description:

"*Panic luisant; Panicum nitidum.* Illustr. no. 899.

"*Panicum panicula ramosa subviolacea, glumis obtusis striatis hispidulis, semine nitido.*

"Sa tige est à peine haute d'un pied, glabre, articulée, feuillée. Les feuilles sont larges de deux ou trois lignes, glabres, excepté à l'entrée de leur gaine, qui est longue et striée. La panicule est médiocre, rameuse, longue de deux à trois pouces, et teinte d'un violet-brun, ainsi que les articulations de la tige. Les fleurs sont ovales, obtuses, mutiques, striées, légèrement hispides, d'un vert teint de violet-brun. Les graines sont très luisantes.

"Cette graminée croît dans la Caroline, où elle a été recueillie par Fraser, naturaliste anglois (v. s.). Le citoyen Michaux l'a aussi trouvée dans différentes parties de l'Amérique septentrionale; et il en a recueilli dans la Pensylvanie une variété à fleurs plus petites et à feuilles fort étroites."<sup>1</sup>

<sup>1</sup> The culm is scarcely a foot high, glabrous, articulate, leafy. The leaves are 2 or 3 lines wide, glabrous, except at the beginning of the sheath, which is long and striate. The panicle is medium, branching, 2 to 3 inches long and of a violet-brown color, as are also the articulations of the stem. The flowers are oval, obtuse, muticous, striate, slightly hispid, green tinted with violet-brown. The grain is very shining.

This grass grows in Carolina, where it was collected by Fraser, an English naturalist (v. s.). Michaux also found it in different parts of North America, and he collected in Pennsylvania a variety with smaller flowers and very narrow leaves.

Michaux, Fl. Bor. Am. 1: 49 (1843), gives some additional characters for this species in the following description:

"*Panicum nitidum* Lam. P. glabrum, vaginarum collo barbato culmo gracili, simplici, erecto; foliis paucissimis, remotis, lanceolato-linearibus; panicula capillari, confertiuscula, composite ramosa, glabra; floribus pusillis, obtuse ovatis, minutissime puberulis; valvula extima vix perceptibili."

"Hab. in Pennsylvania et Carolina."

Michaux's plant (fig. 8) in the Herbarium of the Paris Museum of Natural History bears the following label: "Herb. Mus. Paris, Herbier de l'Amérique septentrionale d'André Michaux: *Panicum nitidum* Lam. Hab. en Pensylvanie, Carolina."



FIG. 8.—*Panicum nitidum* Michx., drawn from specimen in the Herbarium of the Muséum d'Histoire Naturelle de Paris by A. H. Baldwin.

forma *densiflorum* Rand. & Redfield, Fl. Mt. Desert Isl. 174 (1894); *Panicum eatoni* Nash, Bull. Torr. Bot. Club, 25: 84 (1898); *Panicum paucipilum* Nash, ibid. 26: 573 (1899).

A glabrous, tufted perennial 6 to 10 dm. high, with erect, narrowly lanceolate leaves, and exserted, contracted panicles, bearing numerous, small, purplish, pubescent

While Lamarck first cites Fraser's plant, yet, judging from his description and from the fact that he evidently had both Fraser's and Michaux's plants in his possession at the time he wrote the longer description, there can be little doubt as to their identity.

We believe that Michaux's plant should be considered as typical *Panicum nitidum* Lam., at least until positive proof is given that it is different from Fraser's plant cited by Lamarck.

*Panicum nitidum* has never been understood by American authors, and many forms have been referred to it by different authorities. Unfortunately no spikelets remain on Michaux's plant, but a careful study of the above descriptions and the drawing of Michaux's plant leads us to consider *Panicum nitidum* as follows:

***Panicum nitidum*** Lam. Tabl. Encycl. 1: 172 (1791); Encycl. 4: 738 (err. typ. 748) (1797); *Panicum* No. 37 (sine nomine) Muhl. Descr. 125 (1817); *Panicum spretum* Schultes, Mant. 2: 248 (1824); *Panicum nitidum*

spikelets. Culms at first simple, becoming dichotomously branched, generally purplish; nodes smooth; sheaths much shorter than the internodes, glabrous, striate, usually slightly ciliate on the margins above; ligule a dense ring of hairs about 2 mm. long; leaf-blades 5 to 10 cm. long, 3 to 10 mm. wide, acuminate, glabrous, or with few papillate hairs at the base. Panicle finally long-exserted, generally contracted, 5 to 13 cm. long; rachis glabrous; branches erect or ascending. Spikelets ovate, 1.4 to 1.6 mm. long; first glume small, one-fourth to one-third as long as the spikelet, glabrous, 1-nerved; second and third glumes



FIG. 9.—*Panicum eatoni* Nash: a, b, c, spikelets; d, anterior view of third glume, showing small palea e, flowering glume, dorsal view; f, the same, anterior view, showing palea.

pubescent with spreading hairs, often densely so, 7-nerved; flowering glume about 1.3 mm. long.

**TYPE LOCALITY.**—Carolina and Pennsylvania. Type specimen in the Herbarium of the Paris Museum of Natural History.

**GENERAL DISTRIBUTION.**—In wet soil, especially near the coast, Maine to Mississippi, and Texas. May to September.

**SPECIMENS EXAMINED.**—*Maine:* Shore of Chase's Pond, York, 510 M. L. Fernald, 1891.

*Massachusetts:* Essex County, W. P. Conant, 1891; Stoneham, 320, 336, 349 W. 8613—No. 24—00—3

P. Rich, 1894. *Rhode Island*: Johnston, J. W. Congdon, 1871. *Connecticut*: Waterford, 87 C. B. Graves, 1898. *New Jersey*: Atsion, 44 A. Commons, 1882; Gloucester County, 2 B. Heritage, 1897. *Mississippi*: Beauvoir, 4594 S. M. Tracy, 1898.

The habit of Michaux's plant, as shown by figure 8, is so characteristic and so closely resembles *Panicum eatoni* (Fig. 9) that we have no hesitation in referring *Panicum eatoni* to *Panicum nitidum*. *Panicum paucipilum* can not be satisfactorily distinguished from *P. eatoni*, either by the original descriptions or by comparison of typical material. The culms, sheaths, ligules, leaves, panicles, and

spikelets are the same, and moreover both forms grow in moist places. Mr. Nash<sup>1</sup> states that *Panicum paucipilum* can be distinguished from *P. eatoni* by its much smaller spikelets, with the first glume glabrous and orbicular. The difference in measurements of the spikelets given by Mr. Nash is but 0.2 mm., and according to his original description and to specimens examined the first glume of *P. eatoni* is also glabrous! The type of *Panicum spretum* Schultes in Muhlenberg's Herbarium in the Academy of Nat. Sci. of Phil. is identical with *P. eatoni* Nash., the form with the dense contracted panicles.

The figure of *Panicum eatoni* above has shorter and broader leaves than in the type.

**PANICUM NITIDUM OCTINODUM** (Smith) n. comb. (*Panicum octinodum* Smith, U. S. Dept. Agr. Div. Agros. Bul. 17: 73, fig. 369 (June 30, 1899); Scribn. & Smith, ibid. Cir. 16: 5 (July 1, 1899).)

A form which differs from typical *Panicum nitidum* only in having smooth spikelets.

**TYPE LOCALITY.**—Waller County, Texas.

**GENERAL DISTRIBUTION.**—In ponds and exsiccated swamps, Delaware and Texas.

**SPECIMENS EXAMINED.**—Delaware: Townsend, W. N. Canby, 1891; Cape Henlopen, 340 A. Commons, 1898. Texas: Waller County, F. W. Thurow, 1898 (type).

**PANICUM SCOPARIUM** Lam.

**Panicum scoparium** Lam. Encycl. 4: 744 (1797!); Michx. Fl. Bor. Am. 1: 49 (1803!), not of authors. (*Panicum pubescens* Lam. l. c. 748!; Michx. l. c.!, not of authors. *Panicum viscidum* Ell. Sk. Bot. S. C. and Ga. 1: 123 (1817!). (Fig. 11).

<sup>1</sup> Bul. Torr. Bot. Club, 26: 574 (1899).



FIG. 10.—*Panicum nitidum octinodum* (Smith): a, b, spikelets; c, flowering glume.

A rather stout, erect or ascending and finally much-branched perennial, 3 to 14 dm. high, with the culms and sheaths usually densely pubescent with spreading or reflexed canescent hairs, and all parts somewhat viscid when fresh. Culms stout, often purplish; nodes bearded and with a glabrous ring immediately below; sheaths shorter than the internodes; ligule a dense ring of hairs about 2 mm. long; leaf-blades lanceolate, gradually tapering from near the middle to the very acute apex, subcordate at the base, softly pubescent on both sides, minutely scabrous on the margins, villous on the back at the point of union with the sheath, basal ones ovate, 5 to 10 cm. long, obtuse, those of the primary culm 12 to 25 cm. long, 10 to 20 mm. wide, those of the branches densely crowded and much smaller, 2 to 5 cm. long. Panicles 6 to 15 cm. long, ovate or subpyramidal; rachis more or less pubescent; branches compound to the base, flexuous; pedicels usually much longer than the spikelets. Spikelets 2 to 2.5 mm. long, ovate or ovate-lanceolate, acute; first glume minute, one-fourth as long as the spikelet or less, usually nerveless; second and third glumes strongly pubescent, 9-nerved. Below each of the nodes there is a smooth space about 4 mm. broad, extending around the stem like a ring; the nearly smooth upper portions of the sheaths and panicle branches are mottled with irregular yellow or brown, often purple-bordered spots. In the early flowering stage the culms are nearly always simple and support a single, long-exserted panicle; later the culms become much branched and the branches are terminated by more simple, fewer-flowered panicles which are partially inclosed in the leaf-sheaths. The primary panicle and sometimes the first culm leaves disappear and there is left a much-branched grass with numerous crowded small leaves and many, small, few-flowered, simple panicles. It was this late, much-branched form that Lamarck described as *Panicum pubescens*.

**TYPE LOCALITY.**—"Carolina," Michaux. Type specimen in the Herbarium of the Paris Museum of Natural History.

**GENERAL DISTRIBUTION.**—Low ground, swamps, borders of thickets, etc., Pennsylvania to Tennessee, Florida, Arkansas, and Texas. May to October.

**SPECIMENS EXAMINED.**—*Pennsylvania*: J. McMinn, no locality or date. Tinicum, 114 C. E. Smith; *Delaware*: Ellendale, 32 A. Commons, 1892; Millsboro, 28 A.



FIG. 11.—*Panicum scoparium* Lam: a, b, c, spikelets; d, third glume with palea; e, f, flowering glumes.

Commons, 1894. *District of Columbia*: G. Vasey, 1881; D. L. Topping, 1895; T. H. Kearney, 1895; Deanwood, E. D. Merrill, 1900. *Virginia*: Norfolk, 308 T. H. Kearney, 1895; Portsmouth, 88, 89 Noyes, 1896; Dismal Swamp, G. McCarthy, 1883. *North Carolina*: Wilmington, 4290 Biltmore Herbarium, 1897. *Georgia*: Yellow River, Gwinnett County, J. K. Small, 1893; Americus, S. M. Tracy, 1897. *Alabama*: Tuskegee, 52, 87 G. W. Carver, 1897; Cullman, C. Mohr, 1895; Auburn, 3978 S. M. Tracy, 1897. *Florida*: Baldwin, 67 R. Combs, 1898; Chipley to Bay Head, 616 Combs, 1898; Duval County, A. H. Curtiss; Apalachicola,

A. W. Chapman, 4290a Biltmore Herbarium; Lake City, 2204 G. V. Nash, 1895. *Mississippi*: Pachuta, 3306 S. M. Tracy, 1897. *Louisiana*: Arcadia, 77 C. R. Ball, 1898. *Arkansas*: F. L. Harvey; Miller County, 116 H. Eggert, 1896; Texarkana, 4236 A. A. & E. G. Heller, 1898. *Texas*: Waller, F. W. Thurow, 1898; Fort Smith to Rio Grande, Choctaw Agency, J. M. Bigelow, 1853-54; Hempstead, 829 E. Hall, 1872; no locality, G. C. Nealley.

There are two sheets of *Panicum scoparium* in the Herbarium of the Paris Museum, one with the following label: “*Panicum scoparium* Lam. donné par le C. Michaux, Herb. Mus. Paris, Herbier de Lamarck acquis en novembre, 1886,” which is evidently Lamarck’s type. (Fig. 12.) The second sheet is identical with this and bears the following label: “*Panicum scoparium* Lam. in pratis sylvestris, Carolina, Herb. Mus. Paris, Herbier de l’Amérique septentrionale d’André Michaux.” Some American authors have recognized that *Panicum scoparium* of Michaux was identical with *P. viscidum* Ell., but wrongly considered Michaux’s plant distinct from *Panicum scoparium* Lam. Both Lamarck’s and Michaux’s specimens of *P. scoparium* are identical with the form long known as *Panicum viscidum* Ell. For the plant wrongly considered by Elliott as *Panicum scoparium*, we propose the following name: ***Panicum ravenelii*** Scribn. & Merrill, nom. nov. (*Panicum scoparium* of Ell. Sk. Bot. S. C. and Ga. 1: 119. 1817. Not Lam. Encycl. 4: 744. 1797.)

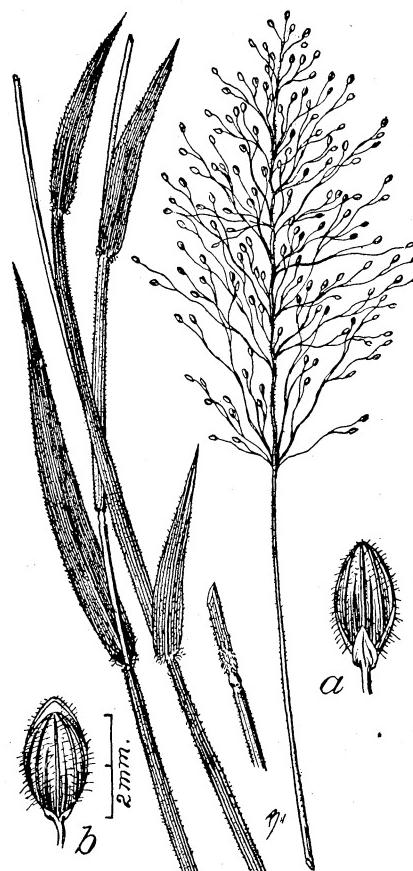


FIG. 12.—*Panicum scoparium* Lam: a, b, spikelets. Drawn from type specimen in the Herbarium of the Paris Museum of Natural History.

*Panicum pubescens* Lam. is a late, much-branched form of *Panicum scoparium* Lam. In the Herb. Mus. Paris there is one sheet of this species bearing the following label: “*Panicum pubescens* Lam., Hab. in pratis sylvestribus Carolinæ ¼, no. 7, Herb. Mus. Paris, Herbier de l’Amérique septentrionale d’André Michaux.” On this sheet are two specimens, one a fragment much dried and torn, the other

in good condition. (Fig. 13.) These specimens are identical and are matched by the following collections: 77 C. R. Ball, Louisiana, 1898; 3978 S. M. Tracy, Alabama, 1897.

While it is possible that the specimen cited by Lamarck as collected by Sherard in 1721 may be different from Michaux's plant, yet Lamarck's description is certainly that of the latter.

The appearance of the early simple form and the late branched form of this species is so different that it is not to be wondered at that Lamarck considered them



FIG. 13.—*Panicum pubescens* Lam: a, b, spikelets. Drawn from a specimen in the Herbarium of the Paris Muséum of Natural History, by A. H. Baldwin.

distinct species and so described them, especially as he had only herbarium material to deal with.

The original descriptions of *Panicum scoparium* and *Panicum pubescens* are given below:

“*Panic en balais; Panicum scoparium.*”

“*Panicum panicula ramosa subnudiflora, glumis ovatis striatis villosulis, foliis brevibus pubescentibus.*”

“D'après les exemplaires de cette plante que j'ai vus dans l'herbier du citoyen Jussieu, sa tige doit avoit environ un pied & demi de longueur. Elle est

articulée, feuillée médiocrement, simple, pubescente. Les feuilles sont distantes, courtes, ovales-lancéolées, pointues, pubescentes, & larges d'environ six lignes. La panicule est terminale, longue de quatre ou cinq pouces, rameuse, velue sur son axe & ses principales ramifications, & paroît en grand partie dénuée de fleurs, sans doute par l'effet de la chute prompte de celles qui se sont développées les premières. Les fleurs sont un peu pédicellées, ovales, striées, velues, mutiques. La troisième valve calicinalement est courte, pointue, bien apparente.

“Cette plante a été recueillie dans la Basse-Caroline par le citoyen Michaux (v. s.).”<sup>1</sup> Lamarck, Encycl. 4: 744 (1797).

This plant was collected in South Carolina by Michaux (v. s.).

“*Panic pubescent; Panicum pubescens.*

“*Panicum pubescens panicula parva laxa sessili pauciflora, glumis ovatis sub-pedicellatis, culmo superno ramosissimo.*

“Les tiges, les feuilles, la panicule & les bâles sont couvertes d'un duvet court, très-remarquable, qui donne à la plante une couleur cendrée ou blanchâtre. La tige, qui quelquefois n'a guère plus de six pouces de hauteur, s'élève d'autres fois à la hauteur d'un pied ou un peu plus. Elle est un peu coudée à ses articulations, dont les inférieures sont fréquentes, & se divise dans sa partie supérieure en plusieurs ramifications presque dichotomes. Ses feuilles sont graminées, planes, ou presque planes, larges de deux à trois lignes, d'un vert glauque ou grisâtre, & pubescentes des deux côtés, ainsi que sur leur gaine. Les panicules sont terminales, petites, très-lâches, sessiles, & composées de trois ou quatre ramifications alternes, distantes & pauciflores. Les bâles sont ovales, un peu pédicellées & pubescentes comme les autres parties de la plante. J'ai vu de cette espèce un individu nain dans l'herbier de Vaillant; il l'avait reçue de Sherard en 1721. Le citoyen Michaux l'a trouvée dans la Basse-Caroline (v. s.).”<sup>2</sup> Lamarck, Encycl. 4: 748 (1797).

<sup>1</sup> According to specimens of this plant which I have seen in the herbarium of Jussieu, the culm was about a foot and a half high. It is articulate, sparingly branched, simple, pubescent. The leaves are distant, short, oval-lanceolate, pointed, pubescent, and about 6 lines wide. The panicle is terminal, 4 or 5 inches long, branching, downy on its axis and its principal branches, and seems to be almost entirely bare of flowers, doubtless due to the early fall of those which developed first. The flowers are short-pedicelled, oval, striate, downy, muticous. The third glume is short, pointed, very prominent.

<sup>2</sup> Culms, leaves, panicle, and spikelets are covered with a very peculiar short down, which gives the plant an ashy or whitish color. The culm, which sometimes is not more than 6 inches high, at other times reaches the height of a foot or more. It is slightly bent at its articulations, the lower of which are numerous, and is divided above into several nearly dichotomous branches. The leaves are grasslike, flat, or nearly so, 2 or 3 lines wide, glaucous green or grayish, and pubescent on both sides, as is also the sheath. The panicles are terminal, small, very lax, sessile, and composed of three or four alternate branches, distant and few-flowered. The spikelets are oval, shortly pedicelled and pubescent like the other parts of the plant. I have seen a dwarfed individual of this species in the herbarium of Vaillant, who had received it from Sherard in 1721. Michaux found it in South Carolina (v. s.).

### III.—MISCELLANEOUS NOTES AND DESCRIPTIONS OF NEW SPECIES.

By F. LAMSON-SCRIBNER and CARLETON R. BALL.

The notes and new species presented in the following pages were for the most part elaborated in the preparation of a complete list of the grasses of the Gulf States to accompany a report on the economic grasses of that region. It is believed that the recognition of the five species of *Elymus* will greatly facilitate a better understanding of that genus in the Eastern and Southern States, from both the economic and systematic standpoints. F. L.-S.

#### **ANDROPOGON ARGYRAEUS MACRUS** Hack. in litt.

Sheaths mostly sparingly long-hirsute; leaves scabrous or sometimes sparingly hirsute above; spikes 1 to 2 cm. long; spikelets 6 to 7 mm. long, otherwise as in the species.

Type collected by S. M. Tracy, No. 3891, Biloxi, Mississippi, October 31, 1897.

SPECIMENS EXAMINED.—*Florida*: Apalachicola, A. W. Chapman; McDonald, Orange Co., 57 C. H. Baker, November, 1897. *Mississippi*: Biloxi, 3892, 3900 S. M. Tracy, October, 1898; Columbus, 2954 S. M. Tracy, October, 1895.

#### **ANDROPOGON BAKERI** sp. nov. (Fig. 14.)

A tall, stout perennial, with the short spikes borne on long, slender peduncles; culms 10 to 11 dm. high, smooth or slightly roughened below the upper nodes, lower internodes strongly compressed, the upper terete; sheaths much longer than the internodes, loose, smooth or sparsely hirsute, the lower compressed, keeled, equitant, the upper inclosing the bases of the panicles; ligule membranous, 1 mm. long, fringed with short bristles; leaf-blades 2 to 4 dm. long, 5 to 7 mm. wide, flat, smooth below, somewhat scabrous above. Panicle about 2.5 cm. long, with slender, appressed or somewhat spreading branches, 3 to 4 at each node; joints of the primary branches 3 to 4, secondary 2 to 3, and tertiary usually 1. Spathes 4 to 5 cm. long, green, acuminate, exceeding or somewhat shorter than the racemes. Racemes two, 1.5 to 3 cm. long, 3 to 6 flowered; rachis slender, internodes somewhat clavate, 4 mm. long, shorter than the spikelets, densely clothed with long, silky, white hairs, exceeding the internodes in length. Sessile spikelets yellowish, linear-lanceolate, 5 mm. long; callus barbate with white hairs 2 mm. long; first glume smooth or the keels minutely scabrous, bifid at the apex, 5 mm. long; second glume firm, keeled, scabrous on the keel, 4.5 mm. long, bidentate at apex; third glume hyaline, acuminate; fourth glume hyaline, acuminate, bifid at the apex, and bearing a straight, slender awn 7 to 10 mm. long. Grain fusiform, plano-convex, acute at apex, 3.5 mm. long, tipped with the persistent style. Sterile pedicel about 7 mm. long, erect, densely clothed with long white hairs; sterile spikelet entirely wanting.

Type collected in pine lands at Grasmere, Florida, 58 C. H. Baker, November 13, 1897.

**ANDROPOGON LINNAEANUS** (Hack.) Scribn. & Kearney, n. comb. (*Sorghum nutans Linnaeanum* Hack. in Mart. Fl. Bras. 2<sup>3</sup>: 276 (1878); *Andropogon nutans Linnaeanus* Hack. in DC. Monog. Phan. 6: 531 (1889).)

**ANDROPOGON MISSISSIPPIENSIS** sp. nov. (Fig. 15.)

A rather small perennial, 4 to 7 dm. high, with few, short-peduncled spikes. Culms slender, smooth, purplish where exposed, the lower internodes somewhat compressed; sheaths about one-half as long as the internodes, strongly striate, densely hirsute or papillose-hirsute with white hairs 2 to 3 mm. long, the lower ones equitant, crowded; ligule a very short membranous ring; leaf-blades 1 to 2.5

dm. long, 2 to 3 mm. wide, acuminate, flat, hirsute below, papillose-hirsute above, midrib and margins strongly scabrous. Panicle 2 to 2.5 dm. long, slender, interrupted, nearly simple; branches 7 to 15 cm. long, appressed, single, 2-noded. Spathe 4 to 4.5 cm. long, equaling or shorter than the racemes, abruptly acuminate into an awn 2 to 3 mm. long. Racemes in pairs, 2 to 4 cm. long, 6 to 12 flowered; internodes somewhat clavate, shorter than the spikelets, 2.5 mm. long, densely clothed with long, white, silky hairs, 5 to 7 mm. long; sessile spikelet yellowish, linear-lanceolate, 4 mm. long; callus barbate with hairs 3 mm. long; first glume hispid-scabrous on the flat or depressed back and on the keels, especially toward the apex, nerveless between the keels, 3.5 to 4 mm. long, 1 to 1.2 mm. broad; second glume firm, strongly compressed, keeled, scabrous on the keel, hirsute on the margins, 3.5 mm. long, bidentate at the acute apex; third and fourth glumes hyaline, acuminate, the fourth bearing an erect, slender awn, twisted at the base, 1.5 to 2 cm. long; sterile pedicel 4 mm. long,

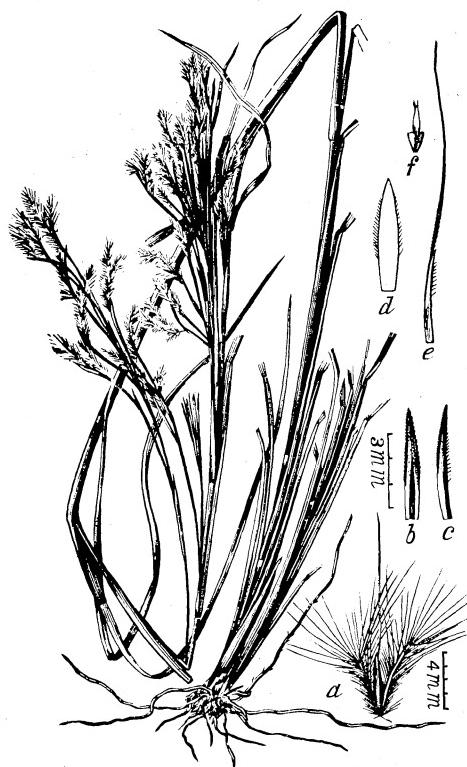
FIG. 14.—*Andropogon bakeri* Scribn. & Ball: a, a spikelet and joint of the axis; b, first glume; c, second glume; d, third glume; e, awned fourth glume; f, pistil and lodicules.

slender, densely clothed with long, white, silky hairs; sterile spikelet reduced to a single scale 2 to 3 mm. long.  
Related to *A. argyreus*, but easily separated by the hirsute sheaths and leaves, the narrow, simpler, interrupted panicle, and broader, scabrous first glume. Distinguished from *A. cabanisii* by its hirsuteness and by the nerveless intercarinal space of the first glume.

Type collected at Biloxi, Mississippi, 3818 S. M. Tracy, October 14, 1897. No. 3817  
S. M. Tracy also belongs here.

**ANDROPOGON SCOPARIUS POLYCLADUS** var. nov.

Stout, 9 to 12 dm. high, glabrous, somewhat glaucous; panicles large, much branched, 3 to 5 dm. long.



Type collected at Braidentown, Manatee County, Florida, 1298 Robert Combs, October 3, 1898. "In old fields and orange groves along the Manatee; abundant in places." Tracy's No. 5330, from Biloxi, Mississippi, and a plant collected by John K. Small on the slopes and summit of Stone Mountain, Georgia, September 6-12, 1894, belong here.

**ANDROPOGON SCOPARIUS VILLOSISSIMUS** Kearn. var. nov.

Sheaths and usually the blades villous.

Type collected in very dry soil along the railroad at Waynesboro, Mississippi, 136 T. H. Kearney, jr., October 2, 1896. Other specimens are: *North Carolina*: Clifton, Bladen County, 20b Biltmore Herbarium, October, 1897. *Florida*: Grasmere, 1156 R. Combs and C. H. Baker, September, 1896; McDonald, Orange County, 139 C. H. Baker, November, 1898; Tampa, 1371 R. Combs, October, 1898. *Mississippi*: Saltillo, S. M. Tracy, October 18, 1892. *Louisiana*: Lake Charles, 3702, 3703 S. M. Tracy, August, 1897; Oberlin, 219 C. R. Ball, September, 1898.

**Paspalum altissimum** Le Conte, Journ. Phys. 91: 285 (1820).

"13. *Altissimum*. Glabrum, erectum, altum; foliis longis, basi vaginisque ad oras ciliatis; spicis 4-5 alternis, erectis, basi pilosis; glumis magnis, orbiculatis, biseriatis; rachi latiuscula, dentibus unifloris. Gramen rigidum, quinque pedale. Habitat prope Salem Carolinas borealis. 2."

Dr. Vasey, in his notes on Le Conte's *Paspalums*,<sup>1</sup> refers this to *P. floridanum* Mx., with which it has always been confounded. He also calls attention to the fact that Le Conte's type has but two racemes, although the description reads "racemis 4-5." Le Conte described a form of *P. laeve* Mx. as *P. floridanum* Mx.

*P. altissimum* is intermediate between *P. floridanum* Mx. and *P. bifidum* (Bertol) Nash, with slender, erect culms, hirsute sheaths and long, slender leaves, hirsute above and often below also. Racemes 1 to 3, rather loosely flowered.

**GENERAL DISTRIBUTION.**—Not uncommon in rather dry, open pine lands near the coast, from the Carolinas to Louisiana.

**SPECIMENS EXAMINED.**—*South Carolina*: Florence, 688 C. R. Ball, August, 1900. *Florida*:



FIG. 15.—*Andropogon mississippiensis* Scribn. & Ball: a, a spikelet, showing joint of axis, etc.

<sup>1</sup> Proc. Acad. Nat. Sci. Phil. 1886: 288 (1886).

no locality, A. W. Chapman; Bay Head, 636 R. Combs, August, 1898; Chipley, 594 R. Combs, August, 1898; De Funiak Springs, 471 R. Combs, August, 1898; Jacksonville, 149 T. H. Kearney, jr., July, 1895; Marianna, 3669 S. M. Tracy, August, 1897; Monticello, 343 R. Combs, August, 1898. *Georgia*: Thomasville, 3671 S. M. Tracy, August, 1897. *Alabama*: no locality, 333 A. Winchell; Mobile, C. Mohr. *Mississippi*: Bay St. Louis, 21 A. B. Langlois, September, 1883; Biloxi, 3743 S. M. Tracy, September, 1897; Nicholson, 345 T. H. Kearney, jr., 1896; Ocean Springs, 23 S. M. Tracy, August, 1889; 289 T. H. Kearney, jr., October, 1896;

Waynesboro, 143 T. H. Kearney, jr., October, 1896. *Louisiana*: Alexandria, 171 C. R. Ball, September, 1898.

### PASPALUM PASPALOIDES VILLOSUM

(Vasey) n. comb. (*P. furcatum villosum* Vasey, Contr. U. S. Nat. Herb. 3: 16 (1892).)

### PANICUM COMBSII sp. nov. (Fig. 16.)

A slender, rather densely caespitose, erect perennial 3 to 6 dm. high, from short, creeping root-stocks, with linear flat leaves and spreading, nearly simple, few-flowered panicles 8 to 15 cm. long. Culms somewhat compressed below, glabrous or minutely puberulent just below the nodes; sheaths more or less compressed, glabrous; ligule very short, ciliate; leaves of the culm 10 to 20 cm. long, 3 to 5 mm. wide, very acute, minutely serrulate-scabrous on the margins, otherwise smooth. Panicle branches more or less spreading, usually solitary, the lower 5 to 7 cm. long; pedicels as long as or shorter than

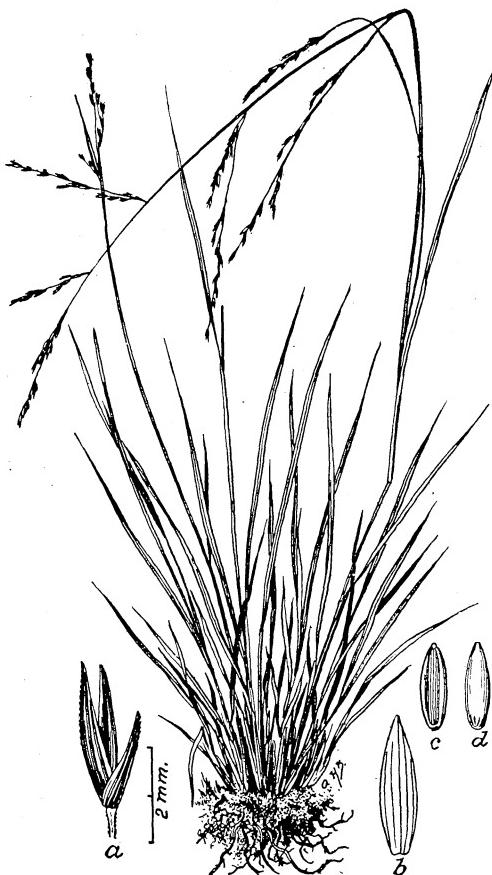


FIG. 16.—*Panicum combsii* Scribn. & Ball: a, spikelet; b, second glume; c, d, flowering glumes.

the spikelets, rarely exceeding them, appressed. Spikelets lanceolate acute, 3 mm. long; first glume broadly lanceolate, acute, 3-nerved, scabrous on the midnerve toward the apex, two-thirds to three-fourths the length of the spikelet; second glume as long as the third glume, 5-nerved, nerves scabrous above; third glume 3 or imperfectly 5-nerved, the marginal nerves faint, indistinctly acuminate-pointed, subacute with a hyaline palea nearly three-fourths its length; flowering glume about 2 mm. long, much shorter than the second and third glumes, narrowly oblong, obtuse, with a few short hairs at the apex; palea scabrous on the keels.

Type collected by Robert Combs, No. 583, for whom the species is named, in damp, fertile flat woods at Chipley, Washington County, Florida, August 20, 1898. A specimen, No. 571, collected August 19, in water of a cypress pond is referred here.

*P. combsii* belongs to the group including *P. agrostoides* Muhl. and *P. longifolium* Torr., but is separated from these by its low tufted habit, shorter, narrow leaves, long, slender spikelets, and elongated lower glume.

**ARISTIDA COMBSII** sp. nov. (Fig. 17.)

A tall, strict, leafy perennial, 8 to 12 dm. high, with long, rigid leaves and large compound panicles. Culms

simple, terete, smooth.

Sheaths longer than the internodes, smooth,

striate, 1 to 1.5 dm. long,

lower mostly purple;

ligule a very short ring;

leaf-blades linear, rigid,

erect, attenuate into a

long subulate point, 3 to

6 dm. long, 2 to 4 mm.

wide, flat or semi-involute, smooth below, scabrous

and somewhat glaucous above. Panicle

large, 4 to 6 dm. long,

strict or somewhat flexuous;

rachis scabrous;

branches long, ascending

or suberect, straight or

flexuous, compound, scabrous,

single or in pairs,

one short and few-flowered,

the lower longer ones 1 to 2.5 dm. in

length, naked at the

base for one-fourth their

length. Spikelets in

pairs, one almost sessile,

the other on a pedicel

one-half as long as the

spikelet; empty glumes

lanceolate, one-nerved,

9 to 10 mm. long, includ-

ing awns, subequal or

the upper usually 0.5 to

1 mm. longer, scabrous on the keels or the lower all over,

tipped with an awn

0.5 to 1 mm. long, longest on the lower glume; flowering glume

7 to 8 mm. long, slightly scabrous toward the apex; callus barbate, 1 mm. long; awns

nearly equal, scabrous, spreading, middle awn 18 to 22 mm. long, lateral awns

16 to 20 mm. long.

Type specimen collected by Robert Combs and C. H. Baker, No. 1069, at Grasmere, Florida, September 21, 1898.

A species with the habit and in part the appearance of *A. palustris* (Chapm.) Vasey, but with a very distinct type of inflorescence.



FIG. 17.—*Aristida combsii* Scribn. & Ball: a, spikelet; b, palea.

GENERAL DISTRIBUTION.—Common in high pine and blackjack lands of central peninsular Florida.

SPECIMENS EXAMINED.—*Florida*: Bartow, Polk County, 1190 R. Combs, September, 1898; Clarcona, Orange County, 81 Marie Meislahn, October, 1899; Crystal, Citrus County, 1015 R. Combs, September, 1898; Eustis, Lake County, 1736 G. V. Nash, August, 1894; Fannin, Levy County, 869 R. Combs, September, 1898; Old Town, Lafayette County, 898a R. Combs, September, 1898; Tampa, Hillsboro County, 1386 R. Combs, October, 1898.

**ARISTIDA INTERMEDIA** sp. nov. (Fig. 18.)

A slender, somewhat geniculate, branching annual, 3 to 7 dm. high, with involute leaves and long, slender panicles. Culms smooth, freely branching, purplish, the outer branches geniculate, ascending; sheaths usually shorter than the internodes, smooth or the lower sparsely hirsute, especially on the margins, and purplish; ligule a very short ring, 0.4 mm. long or less, fringed with short hairs; blades 5 to 15 cm. long, 2 mm. wide, erect, rigid, involute, sometimes sparsely hirsute near the base. Panicle 2 to 4 dm. long, slender, often flexuose; branches short, 2 to 4 cm. long, appressed. Spikelets 8 to 10 mm. long; empty glumes narrowly lanceolate, attenuate into a rather long awn, nearly equal or the upper longer, 7 to 9 mm. long, 1-nerved, scabrous, purplish; flowering glume 7 to 9 mm. long, strongly scabrous above the middle, equaling or exceeding the empty glumes, sometimes regularly spotted as in *A. gracilis*; awns all spreading, the middle one 18 to 22 mm. long, the lateral ones 14 to 17 mm. long, all variable.

This species is most closely allied to *A. gracilis*, but differs in its larger size and



FIG. 18.—*Aristida intermedia* Scribn. & Ball: a, spikelet.

especially in the much longer florets and awns. It is nearly intermediate between *A. gracilis* and *A. purpurascens*, with the habit of the former and spikelets more like those of the latter.

Type collected by T. H. Kearney, jr., No. 204, near Biloxi, Mississippi, October 5, 1896.

GENERAL DISTRIBUTION.—Open, dry, sandy soil, Iowa to Texas and Mississippi.

SPECIMENS EXAMINED.—*Iowa*: Wapsipinicon River, 31 E. N. Wilcox, October, 1896. *Missouri*: Courtney, 649 B. F. Bush, August, 1896. *Nebraska*: Ewing, 1075 J. M. Bates, August, 1897; Simeon, 1115 J. M. Bates, 1897. *Kansas*: Riley County, 425 A. S. Hitchcock, August, 1895. *Arkansas*: Jefferson County, 125 H. Eggert, September, 1896. *Texas*: no locality, S. B. Buckley, 1883; G. C. Nealley, 1889; J. Reverchon, F. W. Thurow. *Louisiana*: Arcadia, 78 C. R. Ball, August, 1898. *Mississippi*: Biloxi, 207, 236

T. H. Kearney, jr., October, 1896; 3774 S. M. Tracy, September, 1897; Horn Island, 1578 S. M. Tracy, September, 1891.

#### **ARISTIDA PURPURASCENS GLAUCAISSIMA**

Kearn. var. nov.

Whole plant very glaucous, otherwise like typical *A. purpurascens*. Conspicuous in the field on account of its bluish-white color.

Type collected by T. H. Kearney, jr., No. 321, in very dry, sterile soil in an opening in the pine forest, 6 miles above Biloxi, Mississippi, October 7, 1896.

#### **TRIODIA SESLERIOIDES**

**ARISTATA** var. nov.

A robust grass, 12 to 18 dm. high. Panicle large, open, its lower branches 2 to 2.5 dm. long; excurrent tips of the nerves in the flowering glume 1 to 1.5 mm. long.

Type collected by Miss Marie Meislahn, No. 90, at Clarcona, Orange County, Florida, October (?), 1899.

GENERAL DISTRIBUTION.—Not uncommon in low, open woods of central Florida.

#### SPECIMENS EXAMINED.—*Florida*:

Grasmere, 1135 R. Combs and C. H. Baker, September, 1898; Homosassa, 978 R. Combs, September, 1898; McDonald, 132 C. H. Baker, October, 1898; Oakwood, Duval County, 322 A. Fredholm, October, 1893; Ormond, 5562 A. H. Curtiss, September, 1895.

#### **ELYMUS ARKANSANUS** sp. nov. (Fig. 19.)

A slender, erect perennial, with a short, broad, bristly, nodding spike. Culms 6 to 8 dm. high, terete, smooth; nodes smooth; sheaths mostly a little shorter than the internodes, ciliate on the margins or the lower sparsely hirsute-pubescent; ligule less than 1 mm. long, membranaceous; leaf-blades 1 to 2 dm. long, 5 to 8 mm. wide, narrowly lanceolate-acuminate, erect or ascending, auricled at the base, scabrous below and on the margins, finely and densely pubescent above.



FIG. 19.—*Elymus arkansanus* Scribn. & Ball: a, dorsal and anterior views of the flowering glume; b, empty glumes.

Spike long-exserted on the slender pedicel, nodding, 6 to 9 cm. long; internodes of the rachis angular, somewhat compressed, hispid-ciliate on the margins, 3 to 4 mm. long. Spikelets 2 at each joint, 2-flowered, the upper very small; empty glumes divergent, linear-subulate, cylindrical and coriaceous at base, flattened, scabrous, and 2 or 3 nerved above, 8 to 10 mm. long, or, including the stout, straight, scabrous awn, 2 to 3 cm. long; flowering glume narrowly lanceolate, acute, raised on a short stipe and separating from it by a horizontal constriction, minutely scabrous, 3 to 5 nerved at apex, 7 mm. long, terminating in a straight, slender, scabrous awn 2 to 4 cm. long. Palea slightly shorter than its glume, rounded or slightly bidentate at apex, hispid on the keels above.

*E. arkansanus* is allied to *E. striatus*, from which it is distinguished by having the empty and flowering glumes minutely scabrous instead of hirsute.

Type collected by F. L. Harvey (Arkansas Flora 7, in part) in woods of northwestern Arkansas. The same sheet bears also a specimen of *E. striatus*.

SPECIMENS EXAMINED.—*Arkansas*: Fort Smith, Dr. J. M. Bigelow, in Whipple's Exploration, 1853–1855. *Missouri*: Springfield, S. A. Hoover, 1897. *Iowa*: Nodaway River, Adair County, F. C. Stewart, July, 1892 (Herb. Iowa State College).

#### **ELYMUS AUSTRALIS** sp. nov. (Fig. 20.)

A tall, stout perennial with broad leaves and a large bristly spike. Culms erect, 9 to 14 dm. high, terete, smooth; nodes smooth; sheaths scab-

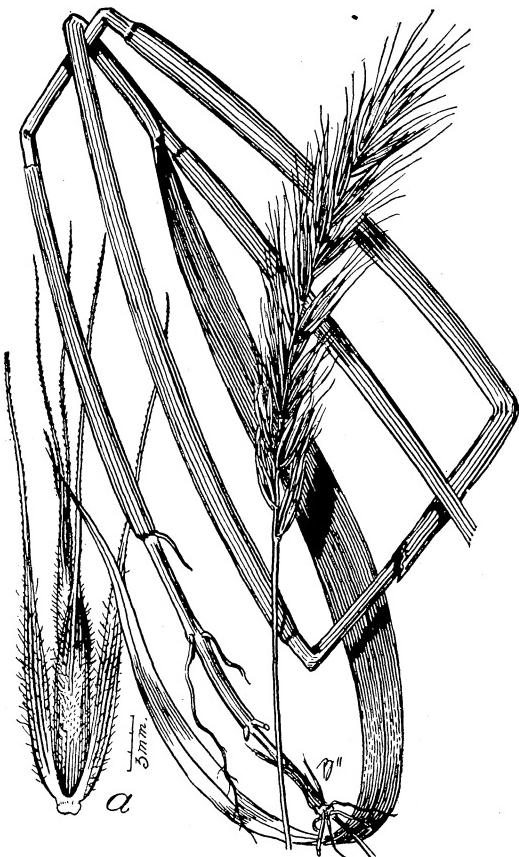


FIG. 20.—*Elymus australis* Scribn. & Ball: *a*, a single spikelet, showing hairy glumes.

rous-hirsute, especially on the margins, longer or shorter than the internodes, the upper ones smooth and somewhat inflated; ligule a mere ring less than 0.5 mm. long, entire; leaf-blades ascending, 2 to 3 dm. long, 1 to 1.5 cm. wide, acuminate, strongly scabrous below, scabrous or scabrous-hirsute above. Spike robust, bristly, 1 to 1.3 dm. long, the peduncle exerted, 0.5 to 1.5 dm.; rachis angular, compressed, scabrous-pubescent on the margins and on the back above. Spikelets 2 at each node, 4 to 5 flowered; empty glumes divergent, thickened, coriaceous and somewhat curved at the base, 5-nerved above, scabrous-hirsute or rarely nearly smooth, about 1.5 cm. long, tipped with a short, straight awn of equal length; flowering glume borne on a stout stipe, lanceolate, 8 to 10 mm.

long, hirsute, tipped with a short, straight, scabrous awn 2.5 to 3 cm. long. Palea a little shorter than its glume, obtuse or minutely bidentate, scabrous between the keels.

This species has heretofore been referred to *E. canadensis* L., *E. virginicus* L., *E. striatus* Willd., and *E. hirsutiglumis* Scribn. From the first it is distinguished by the thickened, hirsute, empty glumes; from *E. virginicus* L. by its hirsute spikelets and longer awns; from *E. striatus* Willd. by more robust culms and spikes and by the thickened 5-nerved empty glumes, while it may be separated from *E. hirsutiglumis* Scribn., its nearest ally, by its more robust spikes and longer glumes and awns.

Type from Biltmore Herbarium, No. 411b, collected on banks of streams at Biltmore, North Carolina, July 7, 1897.

GENERAL DISTRIBUTION.—Moist woods and thickets from North Carolina and Florida west to Arkansas and Missouri.

SPECIMENS EXAMINED.—*Florida*: no locality, A. H. Curtiss, 1886. *Alabama*: Valley Head, 38 A. Ruth, July, 1898. *Georgia*: Augusta, 222 T. H. Kearney, Jr., July, 1895; Luluh Falls, Lookout Mountain, 16 A. Ruth, 1898. *Arkansas*: White River, near Batesville, F. V. Coville, August 2, 1887. *Missouri*: St. Louis, 195 H. Eggert, July, 1879. *Illinois*: no locality, J. Wolf, 1882.

**ELYMUS BRACHYSTACHYS** sp. nov. (Fig. 21.) (*Elymus canadensis glabri-florus* Vasey, Contr. U. S. Nat. Herb. 2: 550 (1894) (in part.).)

A low but rather stout perennial with bristly nodding spikes. Culms 3 to 9 dm. high, erect or somewhat geniculate at base, smooth, terete; nodes smooth; sheaths mostly shorter than the internodes, smooth, striate; ligule a short, entire ring, less than 1 mm. long; leaf-blades 1 to 2 dm. long, 6 to 11 mm. wide, acuminate, ascending, semi-involute, smooth or somewhat scabrous below, finely scabrous above and on the margins. Spike rather dense, 8 to 15 cm. long, long-exserted on a stout peduncle; rachis thickened, striate, 4-angled or more compressed and 2-angled, entirely smooth or scabrous on the angles. Spikelets glabrous, 2 at each joint, 3 to 5 flowered; empty glumes flat, scabrous, 8 to 10 mm. long or with the straight scabrous awn 2.5 to 3.5 cm. long, 1 mm.



FIG. 21.—*Elymus brachystachys* Scribn. & Ball: a, a single spikelet; b, the same with the outer glumes removed.

wide, 3 or rarely 5 nerved; flowering glume smooth or minutely scabrous, borne on a short stipe, 11 to 13 mm. long, 5-nerved, the nerves next the keel often shortly excurrent, tipped with a straight or sometimes divergent scabrous awn 2 to 4 cm. in length. Palea about 10 mm. long, narrow, tapering to a narrow, truncate, or minutely bidentate point, scabrous on the keels.

Closely allied to *E. canadensis* L., but easily distinguished by its smaller size and the scabrous but not hirsute flowering glumes.

GENERAL DISTRIBUTION.—Moist, open or somewhat shaded ground, from Michigan and South Dakota south to Texas, New Mexico, and into Mexico.

Type specimen collected by Dr. Edward Palmer, No. 420, "in the Indian Territory, chiefly on the False Washita, between Fort Cobb and Fort Arbuckle, 1868."

SPECIMENS EXAMINED.—*Michigan*:

"Southern Michigan," 1409 O.

A. Farwell, August, 1893. *Iowa*:

Several specimens in Herb. Iowa State College from western and northern Iowa. *South Dakota*: Hot Springs, 1173, 1174

P. A. Rydberg, August, 1892.

*Colorado*: Colorado Springs, 734 C. L. Shear, July, 1896;

Walsenburg, Huerfano County, 778 C. L. Shear, July, 1896;

Chase, Park County, 1101 C. L. Shear, September, 1896; "along Burl. and Mo. R. Ry.", L. H. Pammel, July, 1896. *Kansas*:

Manhattan, W. A. Kellerman, July, 1888; Osborne, 709 C. L.

Shear, June, 1896; Syracuse, 135 C. H. Thompson, July, 1893. *Texas*: Austin, 34 E. N.

Plank, July, 1892; Kerrville, J. G. Smith, June, 1897; no locality, 571 F. Lindheimer, 1846. *New Mexico*: 2075 C.

Wright, 1851-52. *Mexico*: Saltillo, Coahuila, 260 Dr. E.

Palmer, June, 1898.



FIG. 22.—*Elymus diversiglumis*, Scribn. & Ball: a, anterior view of a floweret and dorsal view of apex of a flowering glume.

A rather stout, erect perennial, 9 to 12 dm. high, with a slender, flexuous spike 1 to 1.5 cm. long, and the empty glumes reduced or nearly wanting. Culms terete, glabrous; nodes glabrous; sheaths glabrous, striate, nearly equaling or longer than the internodes; ligule membranaceous, less than 2 mm. long; leaf-blades spreading, 1.5 to 2.5 cm. long, 6 to 12 mm. wide, tapering to a long-acuminate point, scabrous on both surfaces and the margins; rachis rather slender, compressed, smooth or scabrous-ciliate on the edges and upper part of each internode. Spikelets in pairs, 2-flowered; empty glumes subulate, scabrous, varying from

**ELYMUS DIVERSIGLUMIS**  
sp. nov. (Fig. 22.)

a mere point to 1.5 cm. in length in the same spikelet; flowering glumes, on a short stipe, linear-lanceolate, acute, 8 to 10 mm. long, indistinctly 3 to 5 nerved, scabrous and thinly hirsute, tipped with a stout, divergent, scabrous awn, 2 to 3 cm. long. Palea equaling or slightly shorter than the glume, bidentate, minutely scabrous.

This species is closely allied to *E. canadensis*, but is readily distinguished by the more slender, open inflorescence and the unequal and much reduced empty glumes.

Type collected by T. A. Williams, No. 2653, in rich openings of the Bear Lodge Mountains, Wyoming, July 23, 1897, altitude 6,000 feet.

SPECIMENS EXAMINED.—Wisconsin: No locality, F. F. Wood. North Dakota: Turtle



FIG. 23.—*Elymus glabriiflorus* (Vas.) Scribn. & Ball: *a*, a single spikelet, showing the outer glumes; *b*, anterior view of a floret.

Mountains, Bottineau County, 85 M. A. Brannon, July, 1896; Langdon, 150 M. A. Brannon, July, 1896. Wyoming: Welcome, 2679, 2681 T. A. Williams, July, 1897.

**ELYMUS GLABRIFLORUS** (Vasey) n. comb. (*E. canadensis* var. *glabriiflorus* Vasey, in Dewey, Contr. U. S. Nat. Herb. 2: 550 (1894).) (Fig. 23.)

A tall, stout, leafy perennial with large leaves and long, dense spike. Culms stout, 8613—No. 24—00—4

erect, 6 to 10 dm. high, smooth, terete; nodes smooth; sheaths crowded, longer than the internodes, smooth or rough-hirsute, loose; ligule less than 1 mm. long, entire; leaf-blades numerous, 1.5 to 3 dm. long, 7 to 10 mm. wide, flat or partially involute, erect or ascending, somewhat scabrous below, scabrous on the margins and scabrous and sometimes sparsely hirsute above; spike robust, erect or nodding, 1 to 1.5 dm. long, often glaucous; rachis thick, somewhat compressed, smooth or ciliate, scabrous on the margins. Spikelets 2 to 3 at each node, 3 or 5 flowered; empty glumes thickened, coriaceous and somewhat curved at the base, strongly 3 to 5 nerved, scabrous on the nerves and often ciliate-scabrous on the margins, 11 to 15 mm. long, or with the straight, scabrous awn 3 to 3.5 cm.; flowering glumes on a short stipe, 9 to 12 mm. long, minutely scabrous, tipped with a straight, slender, scabrous awn 2 to 3 cm. long. Palea 8 to 10 mm. long, scabrous on the keels, truncate or minutely bidentate.

This species is more closely allied to *E. australis*, of which it is a glabrous-flowered counterpart, than to *E. canadensis*, from which it is distinguished by the heavier spikes, thickened empty glumes, and merely scabrous flowering glumes, while these first two characters serve to separate it from *E. brachystachys*. It seems unfortunate that this plant should have received the name *E. canadensis glabri-florus* when *E. brachystachys* really stands in that relationship to *E. canadensis*.

Type specimen collected in low, miry, even saltish places at Pointe-à-la-Hache, Louisiana, by A. B. Langlois, No. 81, June, 1885.

**GENERAL DISTRIBUTION**—Low, rich woods or thickets from Pennsylvania and Georgia to Tennessee and New Mexico.

**SPECIMENS EXAMINED.**—*Pennsylvania*: Easton, T. C. Porter, August 13, 1897; Philadelphia, 47 C. E. Smith, August. *District of Columbia*: Tennallytown. *Maryland*: Glen Echo, 15 T. H. Kearney, jr., August, 1894; Hamilton Hill, 701 C. R. Ball, July, 1900. *Virginia*: Norfolk, 293 T. H. Kearney, jr., August, 1895; Portsmouth, 36, 37 Noyes, 1895. *North Carolina*: Columbus, E. C. Townsend, 1897. *South Carolina*: Florence, 686 C. R. Ball, August, 1900. *Georgia*: Banks of the Coosa, mountains of Georgia, 23 A. W. Chapman, 1883. *Tennessee*: Cowan, 23 A. Ruth, July, 1898. *Alabama*: De Kalb County, 6 H. Eggert, June, 1897; Nesheka, 9 G. W. Carver, July, 1897. *Louisiana*: Arcadia, 84 C. R. Ball, August, 1898; Pointe-à-la-Hache, 81 A. B. Langlois (type). *Texas*: Ennis, J. G. Smith, July, 1898; no locality, G. C. Nealley, 1886; F. W. Thurow, 1889. *New Mexico*: 2073 C. Wright, 1851-52.

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